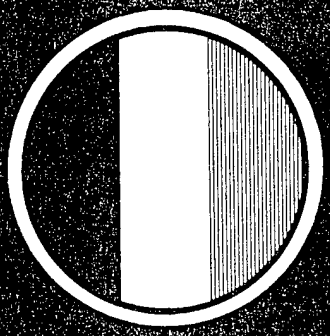
UNITED STATES ARMY TRAINING AND DOCTRINE COMMAND

TRADOC BULLETIN 7



- WEAPONS
- TACTICS
- TRAINING

THE BMP:

CAPABILITIES AND LIMITATIONS

30 JUNE 1977

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The BMP represents a significant departure from previous Threat armored personnel carriers in that it satisfied a longstanding requirement for a highly mobile, amphibious, mechanized infantry vehicle capable of fighting on the move while accompanying tanks.

Only the commander who knows the potential of Threat equipment can effectively counter is; and only he who understnads what present US weapons can accomplish is prepared to use them to their best advantage. The purpose of this bulletin is to discuss the BMP and to propose tactics and techniques that can be used to degrade its effectiveness. But before we can effectively counter a weapon system, we must know it and, to this end, the BMP weapons system is discussed in detail, showing: how it operates; its strengths and weaknesses; how it is employed; how to defeat it.

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UNITED STATES ARMY
TRAINING AND DOCTRINE COMMAND
BULLETIN NO. 7

THE BMP:
CAPABILITIES AND LIMITATIONS

CONTENTS

This TRADOC BULLETIN is intended to provide to commanders, and others concerned with military training, timely technical information on weapons, tactics, and training. It is not intended to supplant doctrinal publications, but to supplement material on "how to fight" with data derived from tests, recent intelligence, or other sources, which probe "why."

TRAINERS' NOTE: The format of this bulletin is designed to help trainers identify and extract needed information. Charts, illustrations, and other key data are unclassified, clearly marked and are boxed-in by a bold line.

Comment or criticism is welcome, and should be directed to:

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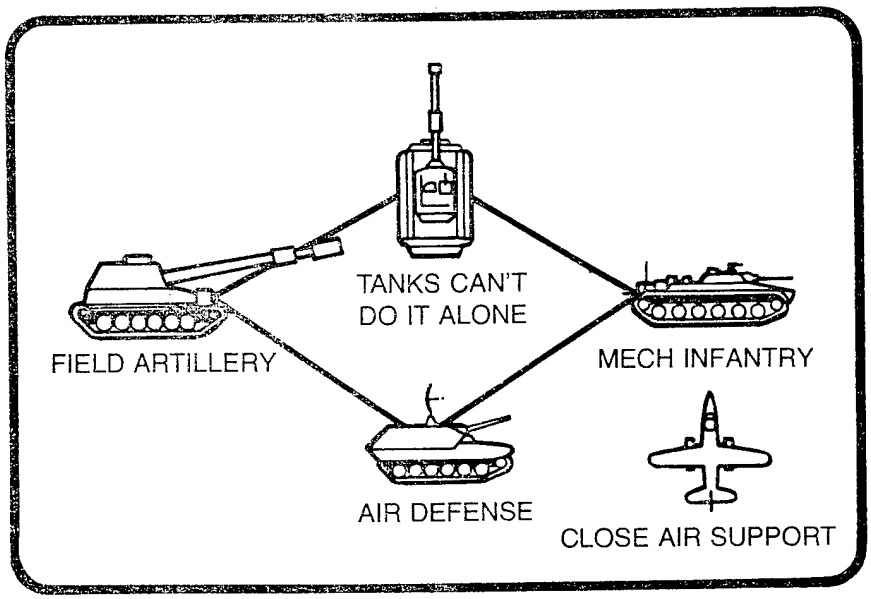
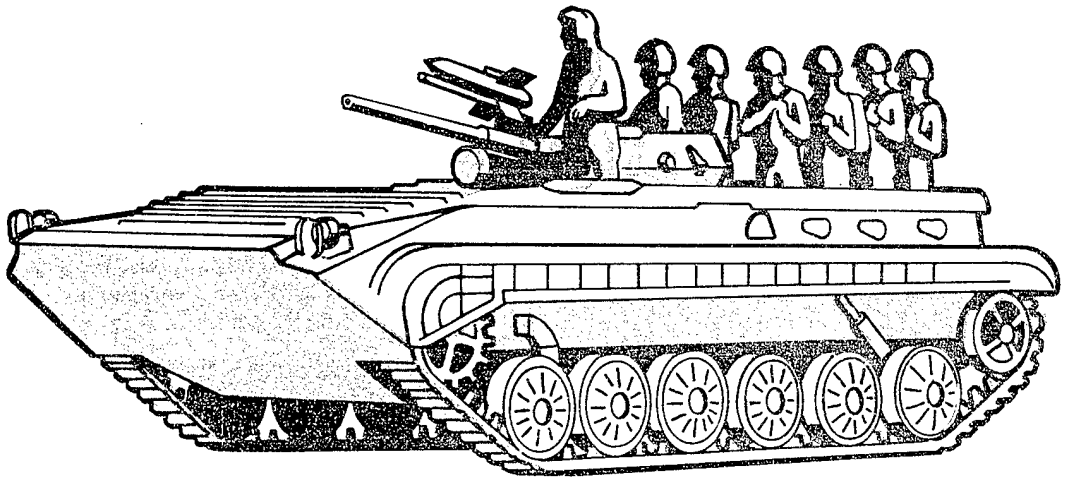
I
INTRODUCTION

Threat doctrine for the modern mechanized battlefield is *identical* with US doctrine *in one important way. Both stress that the tank,* because of its armor, speed, firepower, and relative invulnerability to nuclear weapons, *is* ***essential*** *for decisive offensive combat.* Since US and Threat main battle tanks are roughly equal in capability, *the force that can maintain the greatest number of tanks on the battlefield has a decided edge in mobile warfare.* Hence, both forces seek to reduce the number of opposing tanks as a prerequisite for their own success, and both have developed an array of powerful, accurate antitank weapons.

The effectiveness of US and Threat antitank weapons was clearly shown in the Arab-Israeli conflict of 1973. That war also **proved** that each system can be degraded or nullified by sound tactics, and that each system has vulnerabilities — especially if employed in isolation. *Therefore, the tank must be used as part of a combined arms team, a vital part of which is mechanized infantry.*



Recognizing this fact, several Threat armies have fielded the amphibious armored infantry combat vehicle, BMP, which fully integrates their infantry into modern mechanized warfare.



THE BMP IS:

- ARMORED AND HIGHLY MOBILE
- ACCURATE AND LETHAL
- AMPHIBIOUS

The *BMP represents* a significant departure from previous Threat armored personnel carriers in that it satisfies a longstanding requirement for *a highly mobile, amphibious, mechanized infantry vehicle* capable of fighting on the move while accompanying tanks.

Only the commander who knows the potential of Threat equipment can effectively counter it; and only he who understands what present US weapons can accomplish is prepared to use them to their **best** advantage. The purpose of this bulletin is to discuss the BMP and to propose tactics and techniques that can be used to degrade its effectiveness. But before we can effectively counter a weapon system, we must know it and, to this end, the BMP weapon system is discussed in detail, showing:

- **HOW IT OPERATES**
- **ITS STRENGTHS AND WEAKNESSES**
- **HOW IT IS EMPLOYED**
- **HOW TO DEFEAT IT**

The countermeasures discussed are based on the combat results of recent Middle East (ME) wars and of a study of US tactics vis-a-vis Threat doctrine. Data in this bulletin are from Foreign Science Technology Center (FSTC) sources and from various official reports on the Yom Kippur War. Technical data on the BMP weapons were obtained from FSTC and the US Army Material Systems Analysis Agency (AMSAA).

II
BMP CHARACTERISTICS AND ARMAMENT

The organic armament on the BMP can provide motorized rifle and tank divisions with *significant* firepower at the platoon and company level. Vehicle-mounted weapons, in combination with squad fired weapons, can deliver massed suppression or accurate point fires. The vehicle is watertight and has an air filtration system that allows for continuous combat under nuclear, biological or chemical (NBC) conditions. These characteristics, coupled with its speed and maneuverability, make the BMP a truly formidable fighting vehicle.

BMP CHARACTERISTICS

VEHICLE		PERSONNEL	
WEIGHT	13.6 TONS	CREW/SQUAD	10 or 11
LENGTH	22 FT		
WIDTH	9.5 FT		
HEIGHT	6.3 FT		
ARMOR PROTECTION	.66 to .75 IN		
MAXIMUM SPEED	44 MPH		
CRUISING RANGE	300 MI		

WEAPONS AND AMMUNITION	
73mm SMOOTHBORE GUN	40 RDS (HE AND HEAT)
SAGGER ATGM	4 RDS
PKT 7.62mm COAXIAL MG	2,000 RDS
PKM (2) 7.62mm MG	950 RDS PER WPN
AKMS (6) 7.62mm ASSAULT RIFLE	120 RDS PER WPN
RPG-7 ANTITANK GRENADE LAUNCHER	5 RDS
SA-7 GRAIL SURFACE-TO-AIR MISSILE	1 PER PLT

It is important to note

THE BMP HAS:

- **A LOW SILHOUETTE**
- **EXCELLENT SPEED AND MANEUVERABILITY**
- **A SIGNIFICANT ANTITANK CAPABILITY**

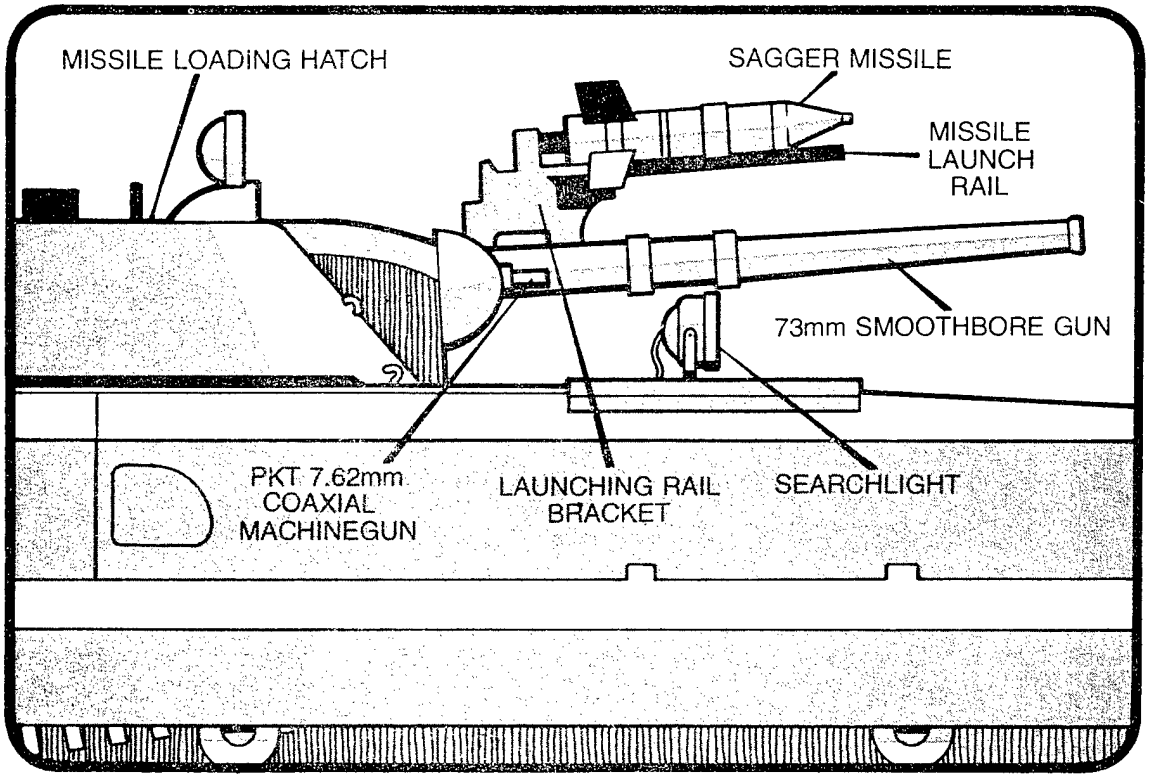
ANALYSIS OF THE WEAPON SYSTEM

The firepower of the BMP is designed around a turret that contains all the equipment necessary to operate and fire the three organic weapons of the BMP:

73MM SMOOTHBORE GUN

SAGGER ATGM

PKT 7.62MM COAXIAL MACHINEGUN

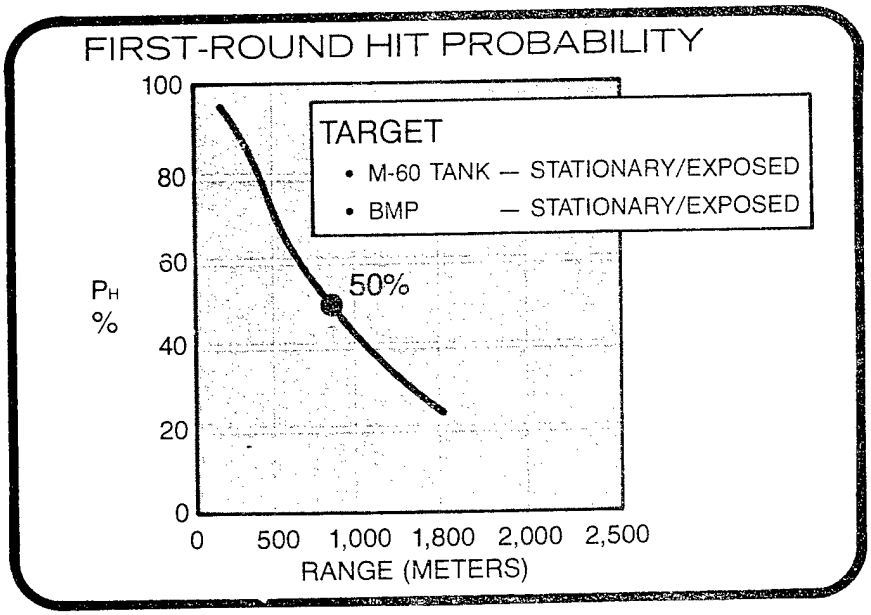


73MM SMOOTHBORE GUN

The 73mm smoothbore gun carries a mix of 40 high explosive (HE) and high explosive antitank (HEAT) rounds. The HE rounds are used to destroy or suppress small arms and ATGM positions. The HEAT round *can penetrate* and therefore is capable of *destroying any of the current family of US armored vehicles.*

1st Round Hit Probability vs. M60 Tank and M113 Armored Personnel Carrier — Stationary

The day/night sight used with the BMP 73mm gun is graduated to 1,300 meters; however, accuracy falls off sharply past 800 meters. This chart shows that a trained 73mm gunner firing from a stationary BMP has a 50 percent chance of a first-round hit on a stationary, fully exposed M60A1 or M113A1 at about 800 meters, while only about a 28 percent chance at 1,300 meters. Night sight data is classified. For details see DIA Special Study DST 11205-428-75 (C).



Remember

- **BMP main gun will defeat any known armor**
  but
- **Was not designed to fire over 1,300 meters**
  and
- **Is less effective against a moving target**

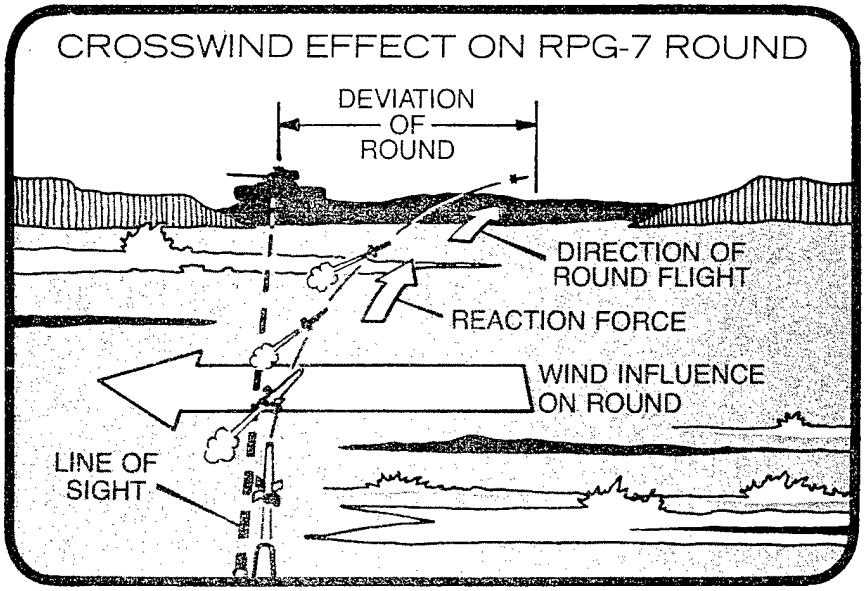
Range Estimation and Lead Error

Like other direct fire weapons, the 73mm gun is affected by:

- Errors in range estimation
- The gunner's ability to apply the correct lead to moving targets.

The range estimation problem has been reduced through weapon design. The round has a very flat trajectory out to 800 meters, thus allowing the gunner to use battlesights at the weapon's most effective ranges.

The 73mm projectile is actually a fin stabilized rocket and is believed to work essentially like the RPG-7 projectile. As shown here for the RPG-7 projectile, the rocket is expelled from the launcher by a propelling charge. The problem of using the correct lead is compounded by the effect of wind on the round. Crosswinds push the projectile off the aimed sighting. As the projectile is deflected by crosswinds, it tends to turn and fly into the wind, causing a significant problem in lead estimation. Since the 73mm projectile is thought to be similar to the RPG-7 projectile, crosswinds may have a similar effect, thus causing the 73mm gun to become *less effective in crosswinds.*



- **The 73mm gun may become less effective the higher the crosswind**

thus

- **The gunner must be highly trained**

Automatic Loading Capability

The 73mm is automatic loading, allowing the gun to fire at a rate of 6 to 8 rounds per minute. After each round is fired, the gun automatically elevates to position itself for loading. This degrades weapon effectiveness in that the gunner cannot use the first round to adjust the accuracy of the second round.

- **The 73mm has a relatively fast rate of fire**

but

- **The gunner cannot use burst on target adjustment**

Firing on the Move

The 73mm HE round can be fired on the move for suppression, but the accuracy is reduced due to lack of gun stabilization. Because of this, the preferred method of fire is from the short halt —10 to 15 seconds.

ON THE MOVE, THE 73mm GUN:

- **Can fire HE rounds to suppress positions**

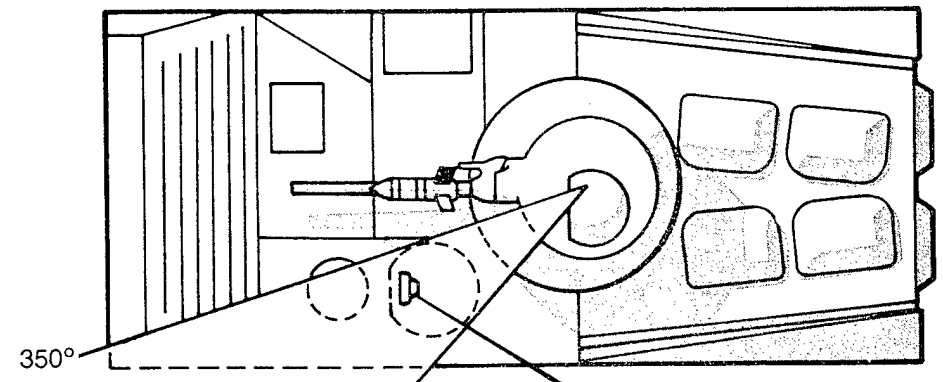
but

- **Is not accurate against point targets**

Main Gun Dead Space

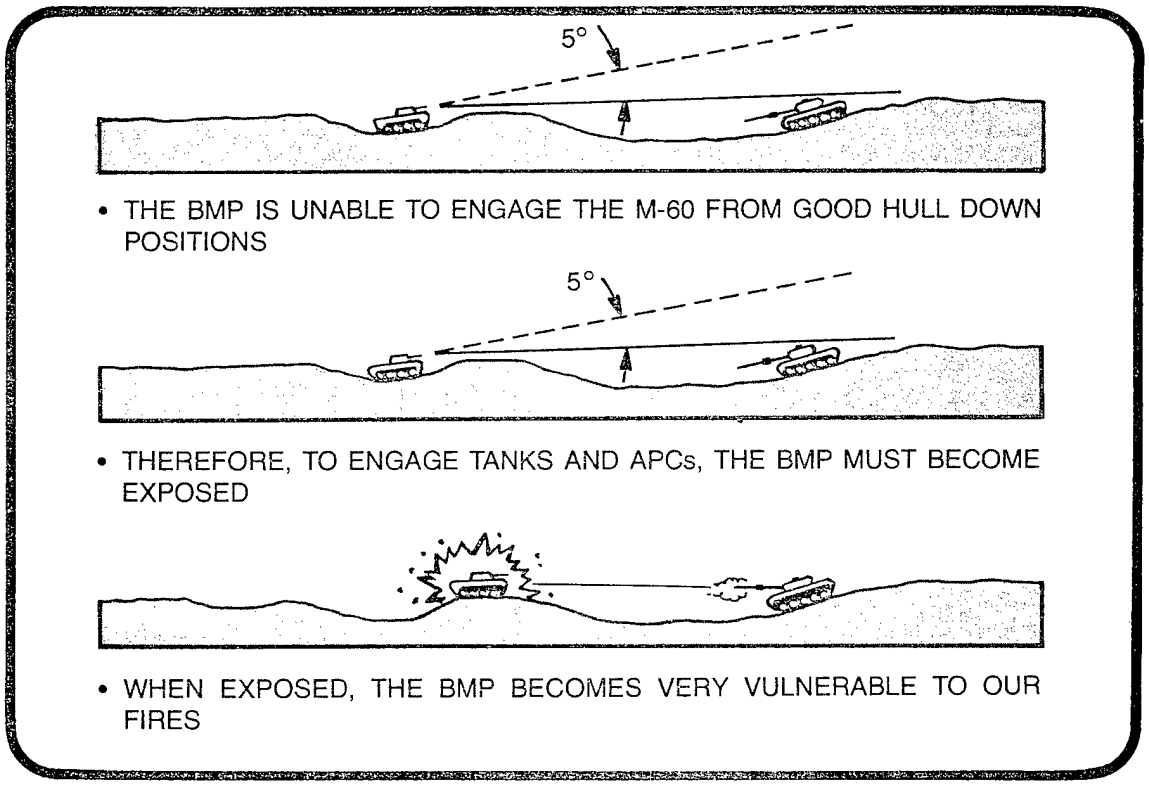
The BMP turret can traverse 360 degrees; however, the main gun must be elevated to clear the commander's IR searchlight. This elevation creates a dead space for the 73mm gun between 10 and 11 o'clock. This means the gun cannot be aimed in the area where the commander has his best vision. We can take advantage of this weakness if we are quick to engage the BMP with our AT weapons from the left front, before it can be maneuvered to return fire with the main gun.

THE BMP IS VULNERABLE TO THE LEFT FRONT



Main Gun Depression

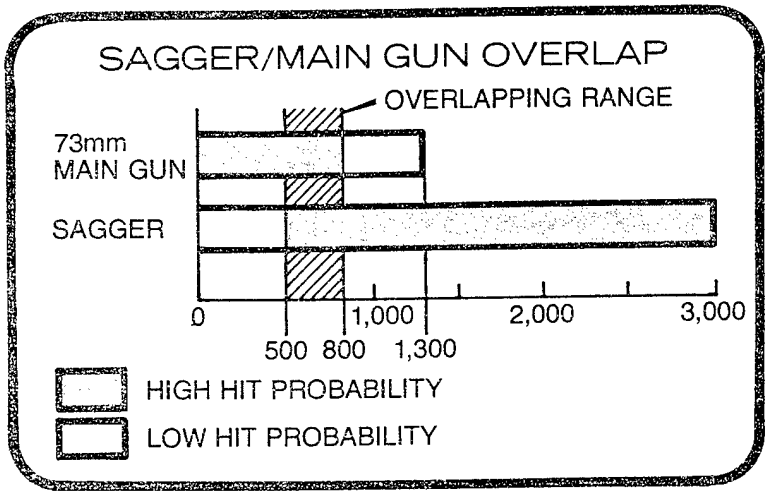
The 73mm gun tube is short in length, and if the gun were depressed, the tube would hit the deck of the vehicle. To prevent this, a depression stop has been installed that permits the gun to depress to only -5 degrees. This depression stop causes a disadvantage when the BMP attempts to fire from hull down positions.



SAGGER ATGM

The SAGGER is a first-generation wire-guided ATGM system. It is mounted, launched, and guided from inside the vehicle, giving the gunner good protection from small arms and artillery fragments. Once the missile is launched, the gunner must visually track the target and also fly the missile to the target using a toggle or "joy" stick that is permanently mounted in the turret.

The addition of the SAGGER to the BMP gives the vehicle an antiarmor capability out to 3,000 meters. However, the SAGGER has a dead space at ranges of 0 to 500 meters because the gunner requires approximately 4 to 5 seconds to bring the missile under control. The 73mm smoothbore gun compensates for this weakness since it has a 50 percent probability of a first-round hit out to about 800 meters. Thus, the two systems complement each other with overlapping ranges as shown:

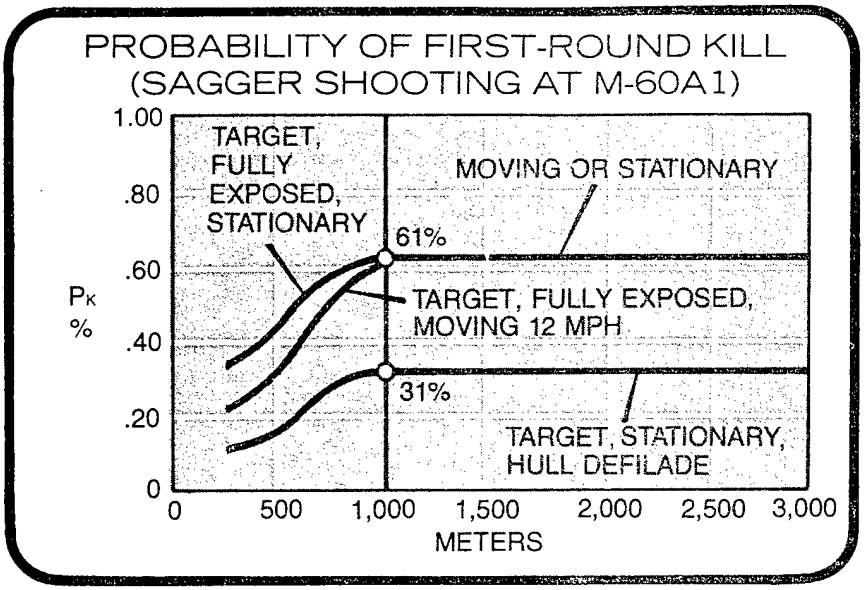


It is important to note that

- **The SAGGER gunner is fully protected which makes him relatively invulnerable to our suppressive fires**
- **The SAGGER must be flown to the target so obscuration of the gunner's vision with smoke will defeat the system**
- **The SAGGER and the 73mm smoothbore gun have overlapping fields of fire that provide the BMP with both short- and long-range antitank fires**

1st Round Kill Probability vs. M60 Tank

Given a hit, the SAGGER missile **can penetrate** and is therefore capable of destroying any of the current family of US armored vehicles. The SAGGER has a *high probability of kill* at ranges beyond 1,000 meters *against both stationary and moving targets that are fully exposed*. At ranges less than 1,000 meters, the probability of kill falls off rapidly, particularly against moving targets. At 1,000 meters or more, it is only half as effective (31 percent) against tanks in hull defilade as it is at the same range against tanks fully exposed (61 percent) as shown in this chart.



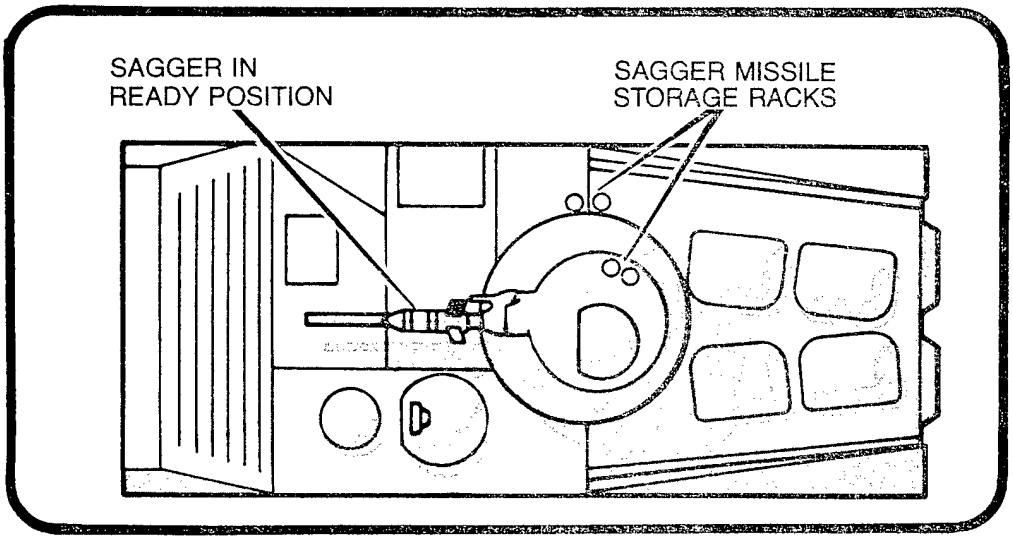
- **The SAGGER is highly effective between 1,000 and 3,000 meters**

but

- **At close ranges its effectiveness drops off rapidly**
- **It is only half as effective against hull down targets**

Sagger Basic Load

There are storage racks inside the BMP for four SAGGER missiles. This is considered the basic interior load. It is possible, however, to mount a fifth SAGGER on the launch rail in the "ready position" prior to entering the battle area.



Firing the SAGGER

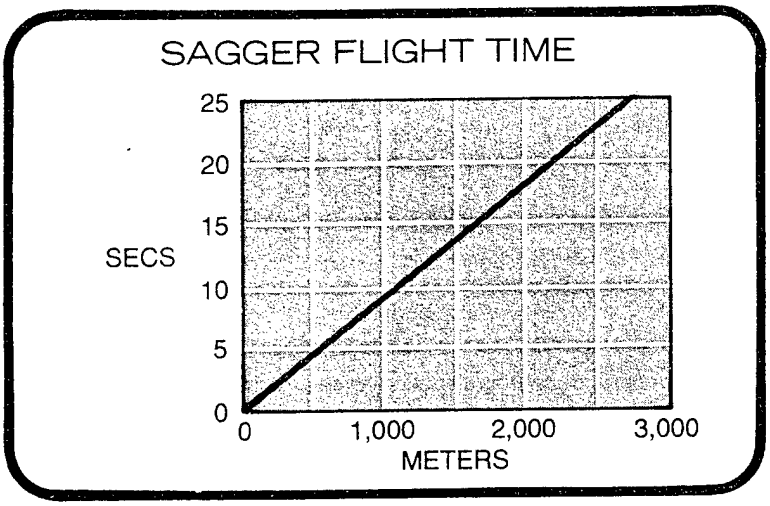
Because the gunner must *simultaneously track the target and fly the missile,* the SAGGER must be fired while the BMP is stationary. This, coupled with the BMP's inability to assume a good hull down position, makes the vehicle vulnerable while firing and tracking the SAGGER.

Remember

- **The BMP must be stationary when firing and tracking the SAGGER**

SAGGER Rate of Fire

The missile's time of flight to 3,000 meters is 27 seconds. Upon impact of the initial round, it takes the gunner 45 to 50 seconds to reload and prepare to reengage. These times, coupled with the time required for target acquisition, make the SAGGER's rate of fire very slow.



It is important to note that

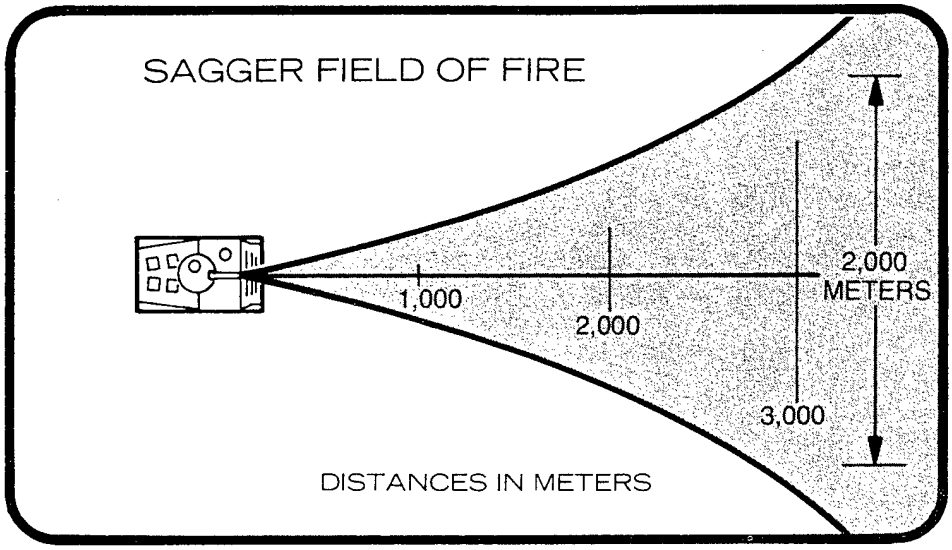
- **The SAGGER rate of fire is less than one round every 2 minutes**

and

- **The missile is slow—you can see it coming**

SAGGER Field of Fire

The horizontal field of fire for an individual SAGGER missile shows the approximate degree to which the missile can be guided in flight. It can be shifted by the gunner to cover targets to the right or left within the cone shown:



- **The SAGGER can shift from one target to another while in flight**

Night Capability

- **The BMP has no night sight to fire the SAGGER missile**

7.62mm PKT COAXIAL MACHINEGUN

The 7.62mm coaxial machinegun is mounted to the right of the 73mm smoothbore gun and is fired by the BMP gunner. The machinegun has a 50 percent probability of hit against area targets out to 1,500 meters and is used primarily for suppression and support of the BMP squad when they dismount. The basic load is one continuous 2,000-round belt of ammunition. Fumes caused by firing are evacuated by a turret ventilation system. The machinegun has the same dead space between 10 and 11 o'clock as the 73mm smoothbore gun. Also, *the machinegun cannot fire accurately while a* SAGGER *missile is being loaded* because the 73mm gun and the machinegun must be fully elevated. Furthermore, as discussed earlier, when the 73mm smoothbore gun is reloading, it automatically elevates, thus making grazing fire impossible.

THE COAXIAL MACHINEGUN:

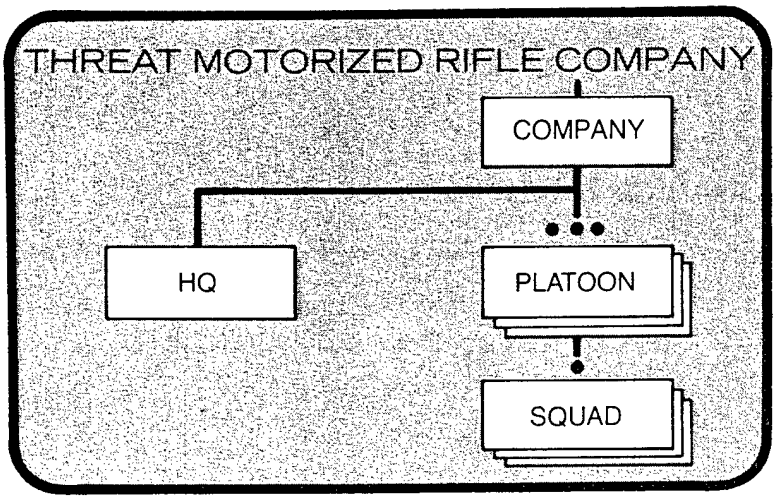
- **Has the same dead space to the left front as the 73mm smoothbore gun**
- **Cannot fire grazing fire while either a SAGGER or the 73mm smoothbore gun is being loaded**

PERSONNEL, INDIVIDUAL AND CREW-SERVED WEAPONS

The BMP is designed to make maximum **use of the individual and crew-served weapons** operated by squad members while affording them good protection from small arms and indirect fire. Organization, crew functions, and squad weapons are discussed below.

ORGANIZATION

The squad is part of a motorized rifle company and platoon.



The Motorized Rifle Company

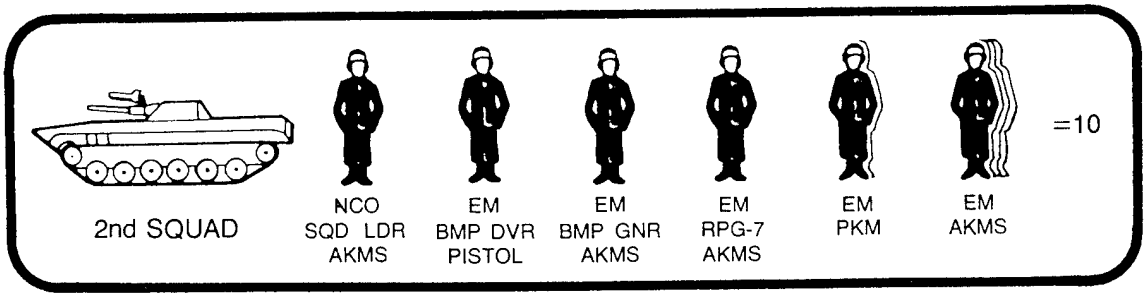
Within a motorized rifle company there are a headquarters section and three platoons for a total of 105 personnel mounted in 10 BMPs.

The Motorized Rifle Platoon

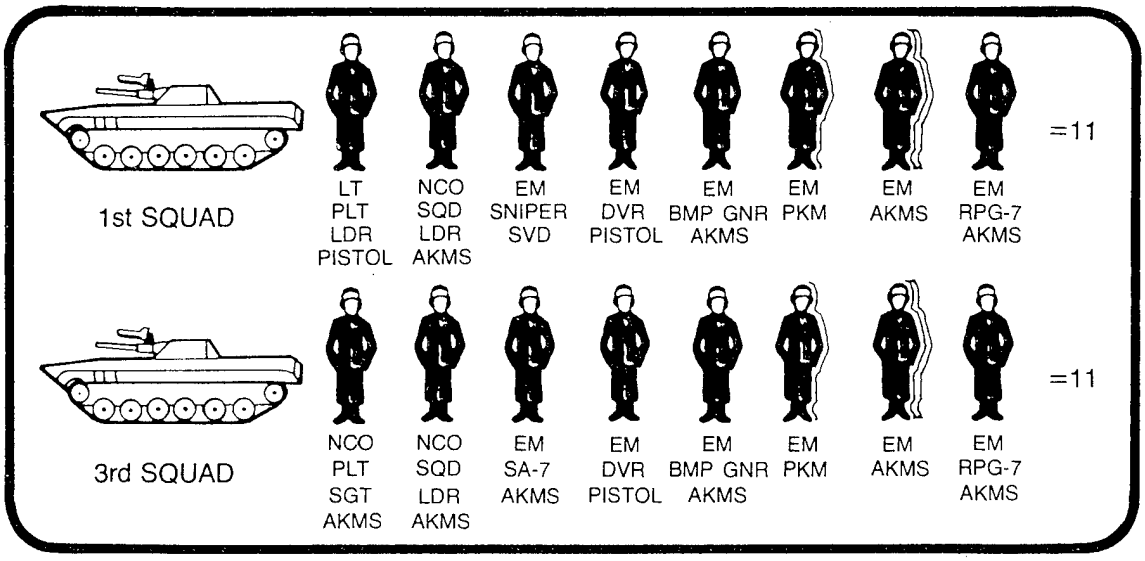
Within a motorized rifle platoon there are three squads, each squad being mounted in a BMP. The total strength of the platoon is 32 men. The squads vary in strength between 10 and 11 personnel.

The Motorized Rifle Squad

The basic squad consists of ten personnel: the driver, gunner, squad leader (vehicle commander), two PKM men, one RPG-7 man, and four men carrying the AKMS.



The other two squads have the addition of an SA-7 GRAIL surface-to-air missile gunner, or a sniper carrying the 7.62mm SVD sniper rifle. These squads have either the platoon leader or the platoon sergeant in lieu of one of the riflemen. These leaders act as vehicle commanders of their respective BMPs.



CREW FUNCTIONS

Commander

The BMP commander is the squad leader and controls disposition of the vehicle unless directed otherwise by the platoon leader or platoon sergeant. The squad leader is usually equivalent in rank to a US sergeant. He is the *only known member of the squad trained in map reading and radio communications. He is also the only member of the crew cross-trained in another specialty such as driver or gunner.* His basic weapon is the AKMS.

Driver

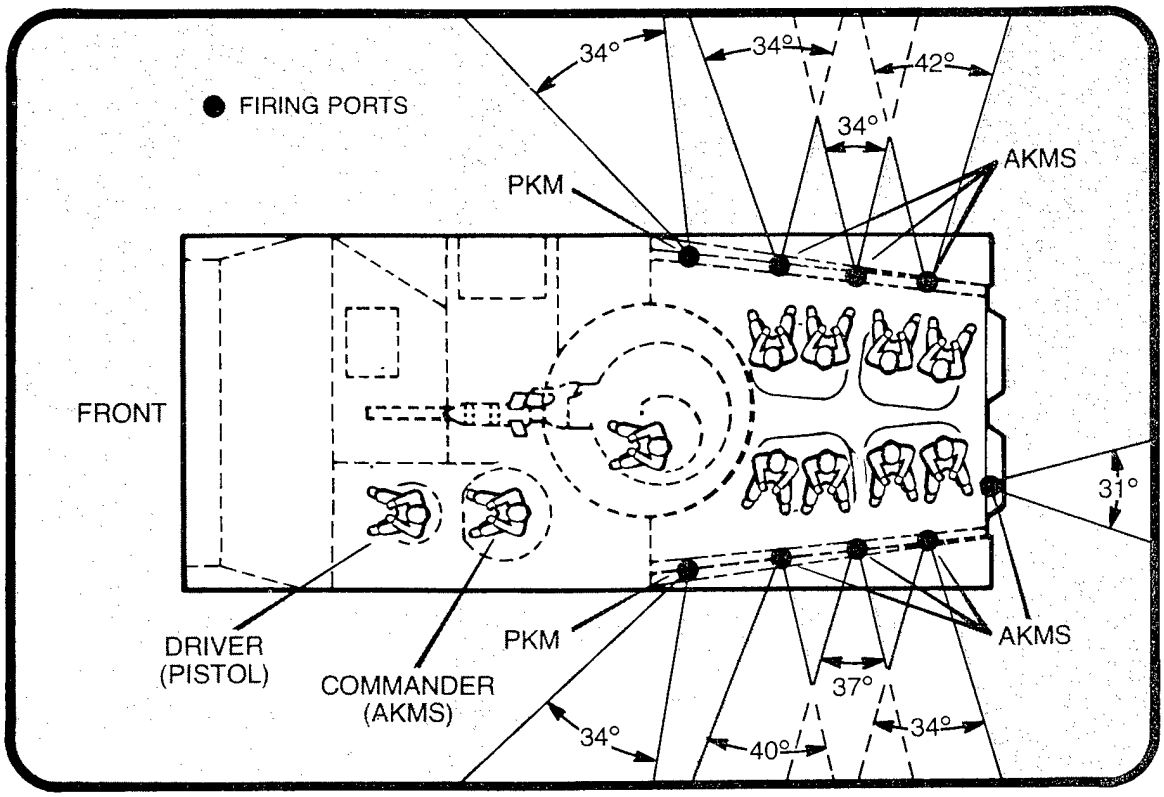
The BMP driver is considered a specialist by virtue of the extensive training program he undergoes. He is responsible for the maintenance of the BMP and all of its integral equipment, less the weapon systems. As a result of this extensive training (six months), he normally is of junior noncommissioned officer rank. His primary weapon is a 9mm automatic pistol.

Gunner

The BMP gunner is in charge of all the BMP's organic weapons. The gunner must operate the 73mm smoothbore gun, the 7.62mm coaxial machinegun, and load, fire, and guide the SAGGER missile. While he receives training in this field prior to unit assignment, it is not extensive enough to warrant the rank of a noncommissioned officer. The gunner is in charge of the vehicle when the commander is dismounted and *will always remain with the vehicle to provide maximum firepower in support of its squad and/or higher echelons.* It is recognized that the driver outranks the gunner; however, the gunner must be in charge so that he can best position the vehicle to support the dismounted squad. Should the gunner be forced to exit the vehicle, his basic weapon is the AKMS.

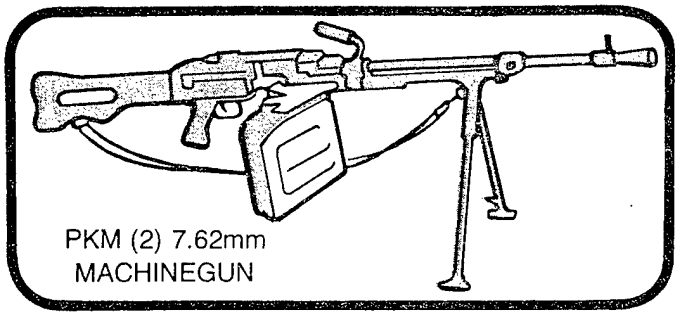
INDIVIDUAL AND CREW-SERVED WEAPONS

The BMP is an infantry fighting vehicle and, as such, the rear troop compartment is designed around the squad. The seating arrangement within the BMP is designed for *offensive* tactics. The squad and crew may all enter or exit through the rear doors. In addition, every position within the BMP is provided with an overhead hatch. The squad members have two-man hatches as opposed to the single hatch for the vehicle commander, driver, and gunner.



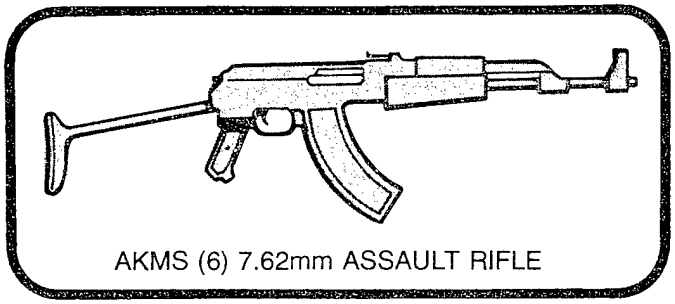
The BMP is equipped with nine firing ports which are designed to provide *overlapping fields of fire*. The forward firing port on each side accommodates a 7.62mm PKM machinegun. The remaining firing ports are used for the AKMS. Each weapon station has a vacuum exhaust system that attaches to the weapon to remove gas and smoke caused by firing. All of the weapons are easily removed for dismounted operations.

For viewing, monitoring, or observing fields of fire, the BMP is equipped with a total of 20 viewing ports. These include one for every firing port, one on the right rear door, three above the driver's hatch, three above the vehicle commander's hatch, and four above the gunner's hatch. While these viewing ports do not provide a 360-degree view per man, *they do provide the squad with a 360-degree field of vision.*



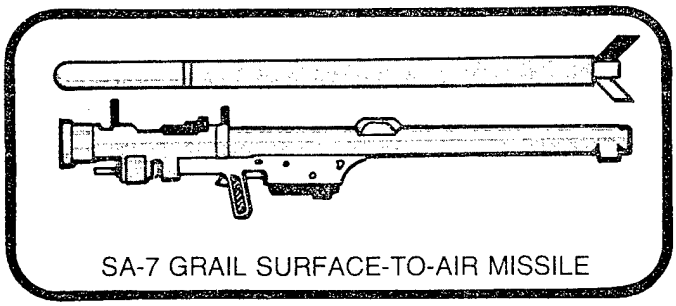
PKM (2) 7.62mm
MACHINEGUN

The BMP is designed to carry two PKM machineguns. The forward-most firing port on each side of the vehicle is designed for this weapon and allows maximum firepower to the front. The PKM on the left side of the vehicle partially covers the dead space of the coaxial machinegun. The PKM is belt-fed, with belt capacities of 100 or 250 rounds. It has a 50 percent probability of hitting a stationary man-size target at 1000 meters. It is easily removed from the firing port for dismounted operations. When dismounted, a rifleman acts as assistant machinegunner.



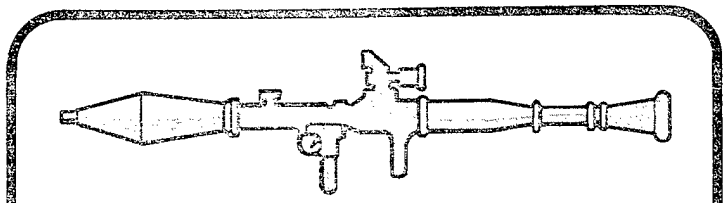
AKMS (6) 7.62mm ASSAULT RIFLE

The AKMS assault rifle is the basic individual weapon of the BMP squad. It has a folding metal stock to allow for its use both as a firing port weapon and as an assault rifle when the squad is dismounted. The AKMS may be fired from seven firing ports, three on each side of the BMP and one in the left rear door. It has a 50 percent probability of hitting a stationary mansize target at 300 meters.



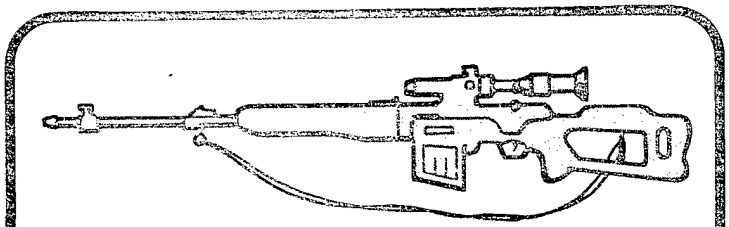
SA-7 GRAIL SURFACE-TO-AIR MISSILE

Each platoon (every third BMP) is equipped with an SA-7 GRAIL missile. It is a shoulder-fired weapon whose primary targets are helicopters or low flying aircraft. It has a slant range of 3.5 kilometers, and an altitude coverage of 150 to 10,000 feet. The GRAIL cannot be fired from inside the BMP; however, *the GRAIL gunner can fire the weapon while standing in a rear hatch.* The squad member asssigned this weapon carries an AKMS as his secondary armament.



RPG-7 ANTITANK GRENADE LAUNCHER

Each squad has an organic RPG-7 grenade launcher. The RPG cannot be fired from inside the BMP; however, *the RPG gunner can fire the weapon while standing in a rear hatch.* The weapon also provides the squad with an antiarmor capability when dismounted. The weapon has a 50 percent chance of a first-round hit on a fully exposed tank at 200 meters. The RPG gunner carries an AKMS as his scondary armament. Additional information on the RPG-7 can be found in TRADOC Bulletin 3.



SVD 7.62mm SNIPER RIFLE

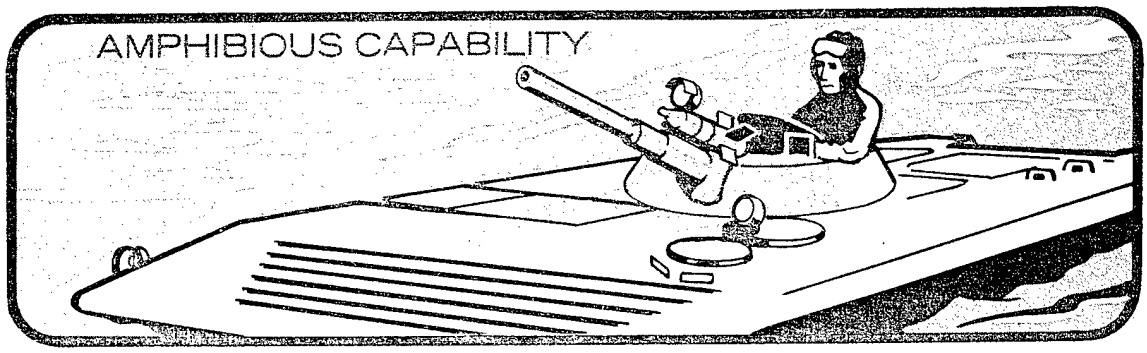
The platoon leader's BMP has a sniper rifle with an assigned gunner. This rifle has a telescopic day sight that gives the platoon sniper a 50 percent probability of hitting a man at 800 meters. He also has an infrared night sight with a range that is slightly less than the day sight. The soldier assigned as the sniper has no secondary weapon.

ADDITIONAL CAPABILITIES

The BMP has the additional capabilities of amphibious operations, laying its own smoke screen, and operating in contaminated environments.

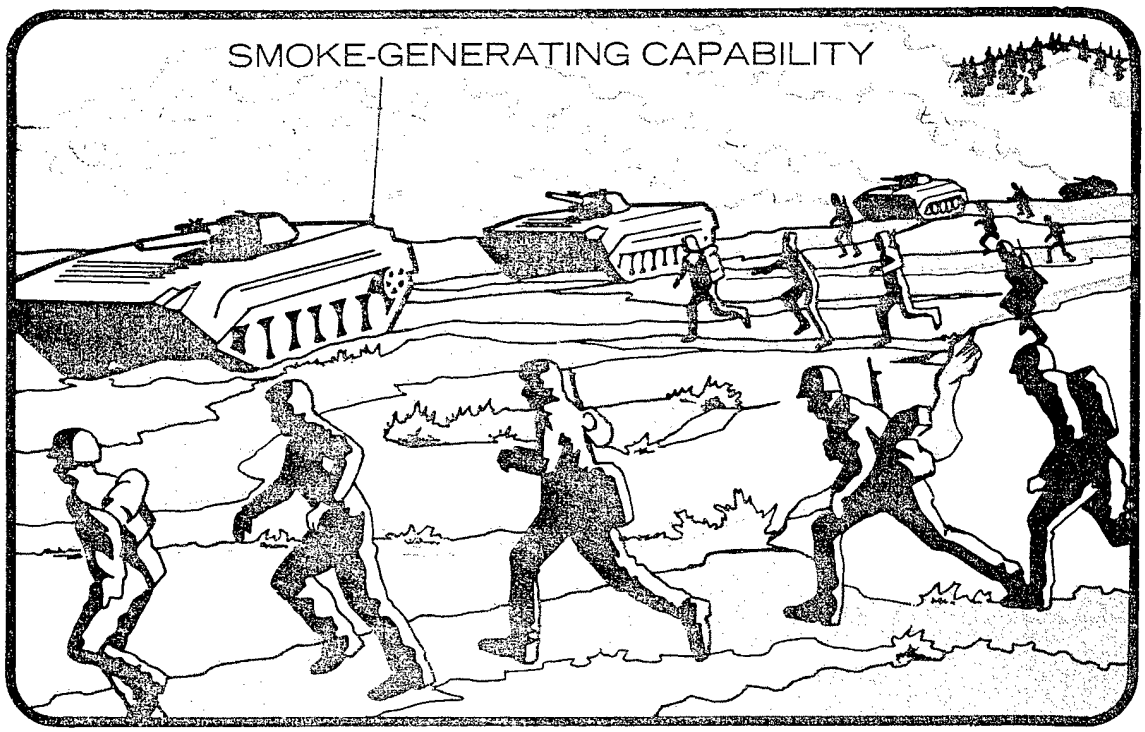
The BMP was designed for amphibious operations. It is watertight and is equipped with a trim vane allowing it to easily swim rivers and streams. To cross rivers with steep banks, the BMP must have engineer support to prepare the entry and exit points.

While in the water, the BMP can fire the 73mm smoothbore gun and the 7.62mm coaxial machinegun.



THE BMP:

- **Was designed for high-speed river crossings**
- **Can fire its main armament while in the water**



The BMP can create its own smokescreen by injecting raw diesel fuel into the exhaust manifold. The heat of the manifold vaporizes the fuel, producing thick white smoke.

THE BMP CAN:

- **Lay its own smokescreen**
- **But the smoke is emitted behind the vehicle**

NUCLEAR, BIOLOGICAL, AND CHEMICAL PROTECTION

MOUNTED

The BMP has a built-in NBC filtering system. The system creates an over-pressure within the vehicle that keeps the contaminated outside air from entering the vehicle. This means that the vehicle is airtight and the occupants are not required to wear protective equipment while "buttoned-up."

DISMOUNTED

When the squad is forced to dismount, they have personal NBC equipment available. While this protective suit is cumbersome and uncomfortable, it is not unusual for Threat soldiers to train wearing protective clothing for up to 8 consecutive hours.

If the Threat soldiers are chemically contaminated while outside the BMP, they must completely decontaminate before they can again unmask and use the built-in protection system.

It is important to note that

- **The BMP was designed to cross contaminated areas quickly without requiring the squad members to wear protective clothing**

III
EMPLOYMENT

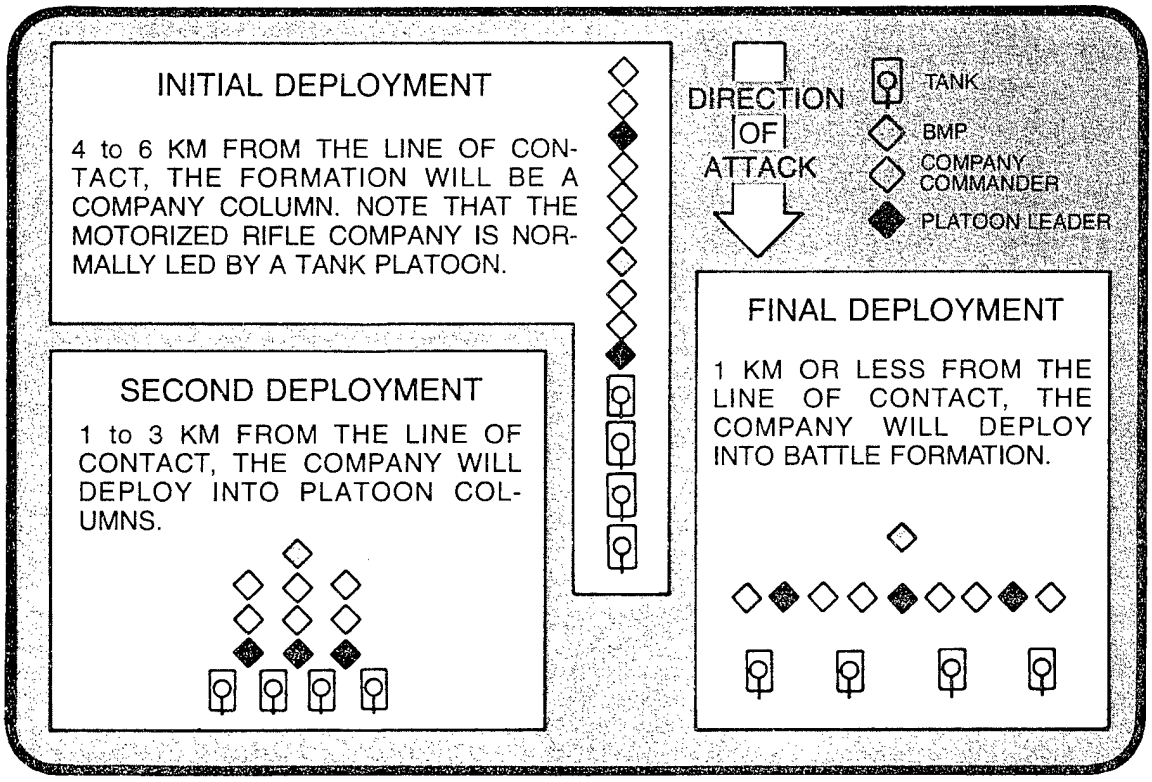
The BMP was designed as an *offensive* weapon to accompany tanks on the battlefield, and to provide *speed, mobility, firepower* and *protection* to the infantry squad.

The BMP's priorities of fires in either offensive or defensive actions are:

- SAGGER against tanks and other armored vehicles from 500 to 3,000 meters
- 73mm main gun against APCs, tanks, and personnel within 1,000 meters
- 7.62mm coaxial machinegun against personnel and soft vehicles out to 1,500 meters
- Individual and crew-served weapons against personnel within 1,000 meters

OFFENSIVE OPERATIONS

Threat offensive operations are based on the use of *large* numbers of mobile, armored vehicles to first rupture an enemy defense, and then to exploit, pursue, and completely defeat the enemy. Because of the large numbers of tanks and BMPs used, and because BMP commanders cannot enter the radio net except under dire circumstances, the Threat has chosen to adopt rigid geometrical formations to ease the problem of command and control.



TYPICAL OFFENSIVE FORMATIONS

Large numbers of armored vehicles using geometrical formations encounter difficulty using the natural protection afforded by the terrain. This means that during offensive

operations, *the majority of Threat forces will be exposed, easily acquired, and will, therefore, be very vulnerable to ATGM and tank fires.*

- **BMPs are employed in geometrical formation normally led by tanks**

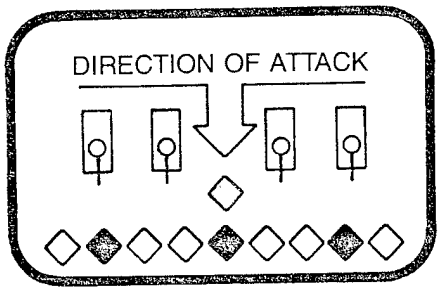
Because of this

- **BMPs have difficulty using the terrain, thus increasing their vulnerability to our ATGM and tank fires**

MOUNTED ASSAULT

In current Threat doctrine, the tank is the most important weapon on the battlefield and will lead initially in all offensive situations, except in very close terrain, during assault river crossings, and sometimes at night.

In close terrain, river crossings, and night operations, BMPs may lead as shown here:



When the defenders' positions have been effectively neutralized by nuclear, chemical, or conventional fires, Threat motorized rifle troops will remain mounted during the assault and will follow 100 to 400 meters behind the tanks until the objective is reached. Both tanks and BMPs will attempt to move at high speed to decrease their vulnerability to enemy ATGMs and tanks. BMPs will help the tanks neutralize the objective by engaging enemy ATGMs with coaxial machinegun and 73mm gun fire. As the objective is overrun, BMP firing ports will be opened, and suppressive small arms fire will be directed at enemy positions.

ACTIONS ON THE OBJECTIVE

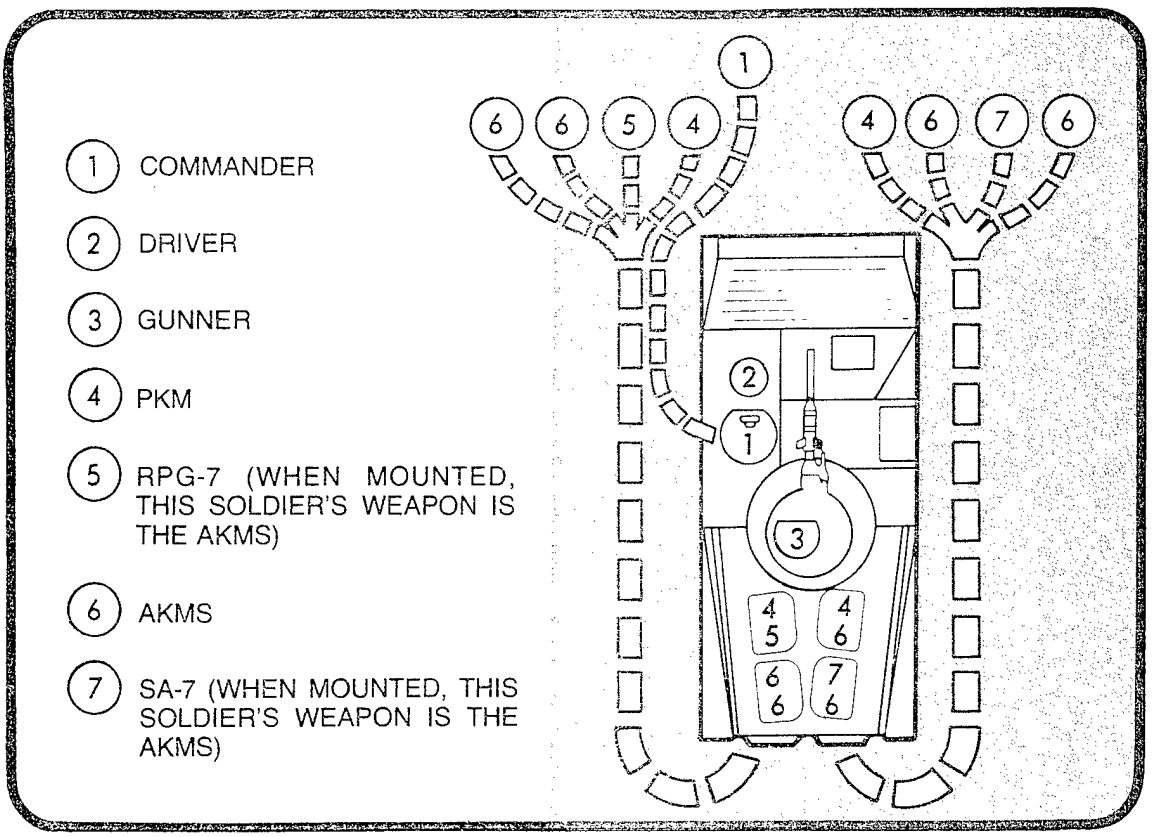
If strong resistance is met within the depth of an objective, motorized rifle troops may dismount and fight through on foot, but the tendency will normally be to push forward as fast as possible, bypassing isolated pockets of resistance.

DISMOUNTED ASSAULT

When the offensive is carried out with conventional weapons, Threat forces will seek open flanks and attempt to bypass enemy battle positions or strongpoints to maintain momentum. If possible, they will avoid close terrain. A dismounted attack will most likely occur:

- When they attack prepared positions or strong points and their artillery and aviation have not been able to eliminate enough antitank weapons and engineer obstacles to permit a mounted attack without excessive casualties
- When they receive heavy antitank fire
- When the attack is made over close terrain.

The dismounting area will normally be in defilade and may be as much as 500 to 1,000 meters from the objective. When the order to dismount is given, the BMPs will slow down to 5 km/h or stop, and the infantry will dismount through the rear doors.



The driver and gunner stay with the BMP providing supporting fires, and follow the dismounted infantry at a distance of 100 to 400 meters.

When dismounted, the squad leader has no radio contact with either his BMP or his platoon leader. Thus, he has no method of coordinating artillery support or the fire support from his own BMP, although he can indicate targets for the latter by using tracers or other predetermined signals. To control his squad in a dismounted assault, the squad leader normally places himself in the center and slightly ahead of the assault line.

The spacing between individual soldiers is usually 6 to 8 meters with a squad frontage of about 50 meters. The PKM machinegun and RPG-7 grenade launcher are normally in the center so that they are under the complete control of the squad leader.

The dismounted troops run forward past the BMP and form a skirmish line behind the tanks. They will advance to the objective, firing their weapons on the move. When the infantry is 25 to 30 meters from the enemy front line, they will throw grenades and then charge on line.

- **When forced to dismount, the BMP squad becomes particularly vulnerable to our artillery and mortar fires, and**
- **The rate of advance will be slowed**

DEFENSIVE OPERATIONS

The Threat assumes the defense only as a *temporary* measure (posture) and seeks every opportunity to resume the offensive. Characteristics of the Threat defense are:

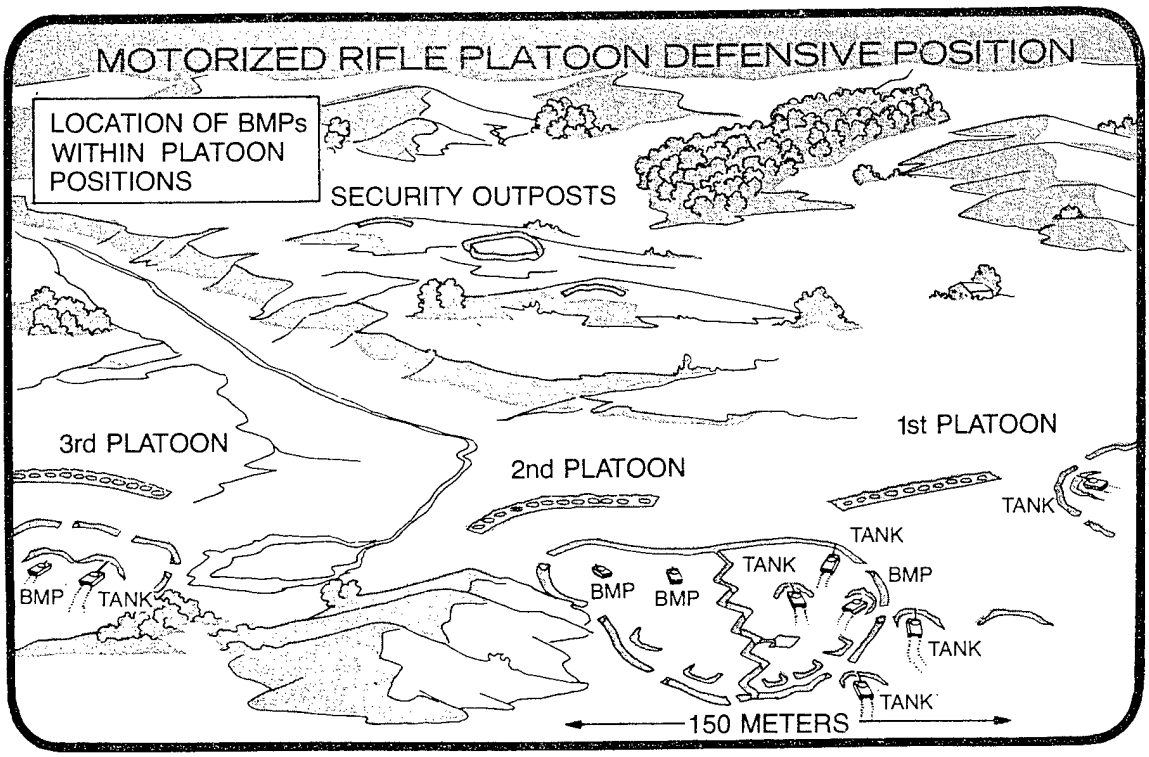
- Defense in depth
- Mutual support between positions
- Antitank-oriented
- Counterattacks by armor heavy forces

While the BMP was designed for offensive operations, consideration must be given to its defensive role.

THE MOTORIZED RIFLE PLATOON

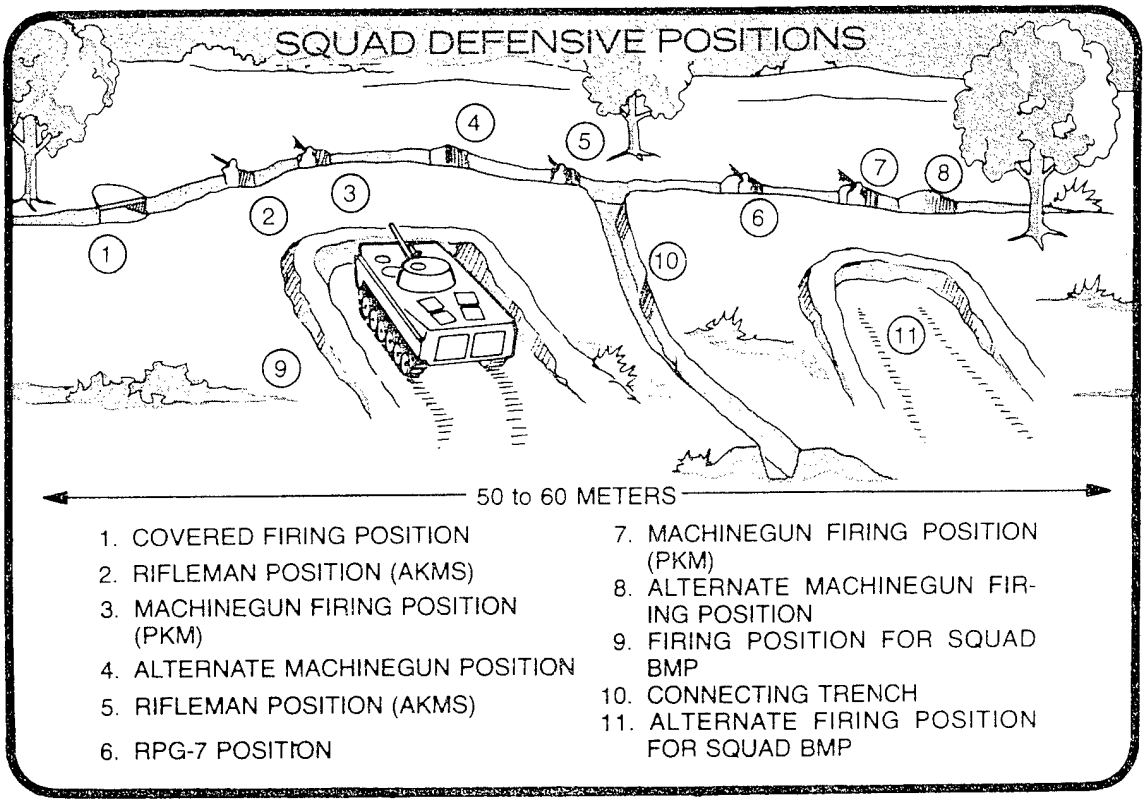
The motorized rifle platoon defends as part of the company and usually occupies a defensive position with a frontage of about 150 meters (up to 300 meters in nuclear conditions) with all three squads on line. The platoon's defensive position has squad trenches, firing positions (main and alternate) for armored personnel carriers and attached weapons, a command and observation post, a dug-out, and a communication trench to the rear as shown in this diagram.

The platoon's mission in the defense is to prevent tanks from breaking through into the reserve positions of the defended area, and to destroy enemy infantrymen before they reach the main line of resistance. Infantry which achieve a breakthrough are destroyed by fires and counterattacks. The platoon only withdraws on order of the company commander.



THE MOTORIZED RIFLE SQUAD

The motorized rifle squad defends as part of the platoon and occupies a frontage of 50 to 60 meters (in nuclear conditions up to 150 meters). The squad engages the enemy forward of, and on the flanks of, the platoon position. The position has weapon pits for the machinegun crews and the antitank grenadier, covered trenches which hold up to four people, two to three recessed pits for ammunition, and primary and alternate positions for the BMP as shown here.



The emplacement for the BMP could be prepared by use of explosives or by engineer equipment. If the squad is not in contact with the enemy, engineer equipment such as the ditch digger from regiment may be used to dig the squad trench. If a ditching machine is not available, the squad uses axes, shovels, crowbars, and entrenching tools to prepare the position. Individual foxholes and firing positions, and an emplacement for the BMP are dug first. A squad trench connecting the individual positions is then constructed. Revetments are used to reinforce the trench system if the soil is unstable.

All or part of a rifle squad may act as a platoon security element to delay and disorganize the enemy and to give warning of his approach. Normally the security element is located about 600 meters away from the platoon position by day, and about 200 meters away by night. The squad leader/security commander places a sentinel forward of the security position at a distance of 100 meters by day and 50 meters at night. When the enemy approaches, the men commence firing and attempt to delay the enemy advance without prolonged combat. The security element withdraws on order of the security commander or according to a prearranged plan.

Positions are established on key terrain to block likely enemy avenues of approach while giving the squad maximum cover and concealment.

All-round defense is assured by preparation of primary, alternate, and supplementary positions.

Antitank defense is provided by the BMP with its 73mm gun and SAGGER missiles, and by the squad grenadier. A squad's BMP may be in the middle of the defensive position, on a flank, or up to 50 meters behind the position. Should the squad be situated along a good armor avenue of approach, the squad could receive additional support from the battalion's antitank platoon or by tanks. The platoon leader would position and control any attached antitank weapons.

Coordinated fires are planned by interlocking squad fires with the fires of adjacent units and by covering all gaps in the squad's sector of fire with concentrated frontal, flanking, and oblique fires. Squad fires are also supplemented by artillery and mortar concentrations which cover dead space and likely enemy avenues of approach. A squad is assigned both a sector of fire and a final protective line.

CONDUCT OF THE DEFENSE

The first enemy element to probe squad defenses may be reconnaissance. The platoon leader is authorized to fire on enemy reconnaissance patrols and, if ordered, the men will fire from their alternate positions so as to deceive the enemy.

Defensive fires will increase in intensity as the enemy approaches the FEBA. Should the enemy assault include tanks, antitank weapons will engage them, SAGGER at ranges out to 3,000 meters, and the 73mm gun at closer ranges. *The primary objective will be to destroy sufficient armored vehicles to cause the enemy to dismount,* thus slowing his rate of advance. Other squad members concentrate on the accompanying infantry.

Though the squad members will attempt to destroy enemy penetrations into the gaps between squads, they will maintain their positions and concentrate on their assigned sector of fire. If attacked from a flank, the squad will distribute its strength to combat the new threat while continuing to cover its original sector of fire. Should enemy tanks overrun the squad position, squad members will attempt to destroy them from the rear with hand antitank grenades and the RPG-7.

The squad may withdraw on orders from the platoon leader. The withdrawal begins with the riflemen who move under cover of the squad's machineguns and the BMP. Squad members will withdraw individually or in groups, depending upon the terrain and the enemy situation. Simultaneous withdrawal of the entire squad normally takes place under cover of fire from supporting units or under conditions of limited visibility.

Remember, in the deliberate defense, the BMP squad:

- **Defends as part of the motorized rifle company**
- **Will establish fighting trenches for personnel and weapon systems**
- **Is prepared to withstand both mounted and dismounted assault**
- **Is directly supported by the BMP's antitank fires**
- **Has no reserve**

IV
COUNTERMEASURES

The BMP is designed to accompany tanks on the battlefield and, as such, provides all-round protection against small arms and low velocity artillery fragments. Like any other vehicle, weaknesses and vulnerabilities are always present. These weaknesses and vulnerabilities can be exploited by a variety of such **active measures** as:

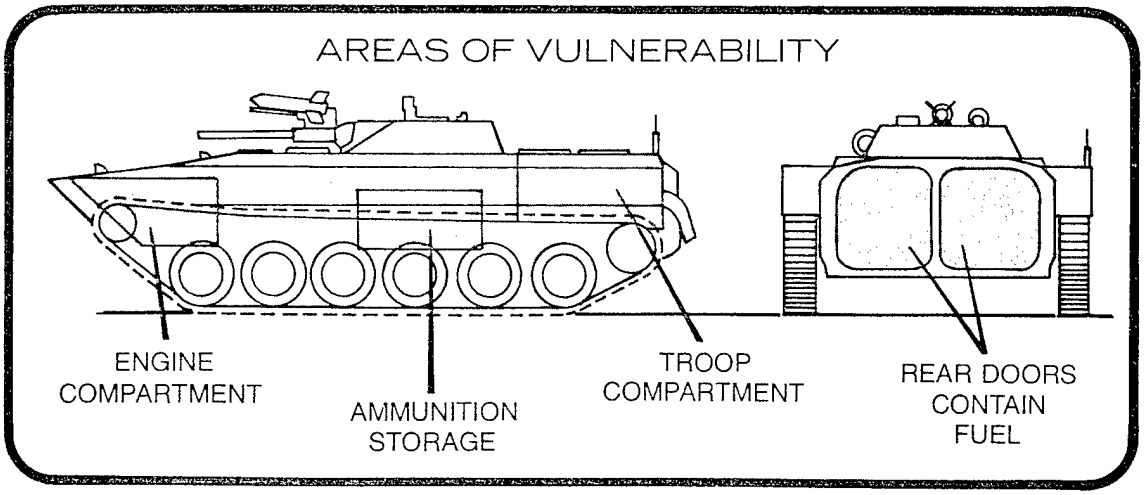
LONG- AND MEDIUM-RANGE WEAPONS
SHORT-RANGE WEAPONS
SUPPORT WEAPONS

In addition to these active measures, the battalion task force can employ such **passive tactics and techniques** as:

COVER, CONCEALMENT, SMOKE, AND SUPPRESSION
OTHER TECHNIQUES

ACTIVE MEASURES

Due to the compactness of the BMP, critical components such as ammunition, fuel, and personnel are located in such a manner that penetration *anywhere* on the vehicle will normally result in a mobility, firepower, or personnel kill. Fire should therefore be concentrated on the:



ENGINE COMPARTMENT — The front-mounted engine is vulnerable to a frontal or flank attack, and a penetration in this area will usually produce a mobility kill.

AMMUNITION STORAGE AREA — A penetration in this area will usually result in catastrophic kill.

TROOP COMPARTMENT — A penetration in this area will usually produce casualties among the squad.

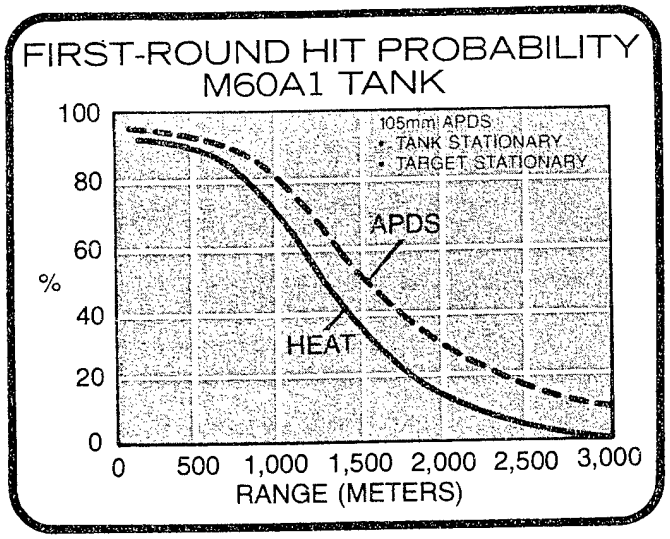
FUEL COMPARTMENT (Rear Doors) — Though diesel fuel is not highly combustible, a penetration in this area will usually deplete the fuel supply, possibly producing an eventual mobility kill.

LONG- AND MEDIUM-RANGE WEAPONS

Tanks

Given a hit, the M60A1 tank's 105mm gun, firing either the HEAT or APDS round, will penetrate any known Threat armor.

This chart shows that at 1,500 meters the M60A1 has a 50 percent probability of a first-round hit firing an APDS round, and a 50 percent probability of a first-round hit firing HEAT ammunition at 1,200 meters against a stationary exposed target.



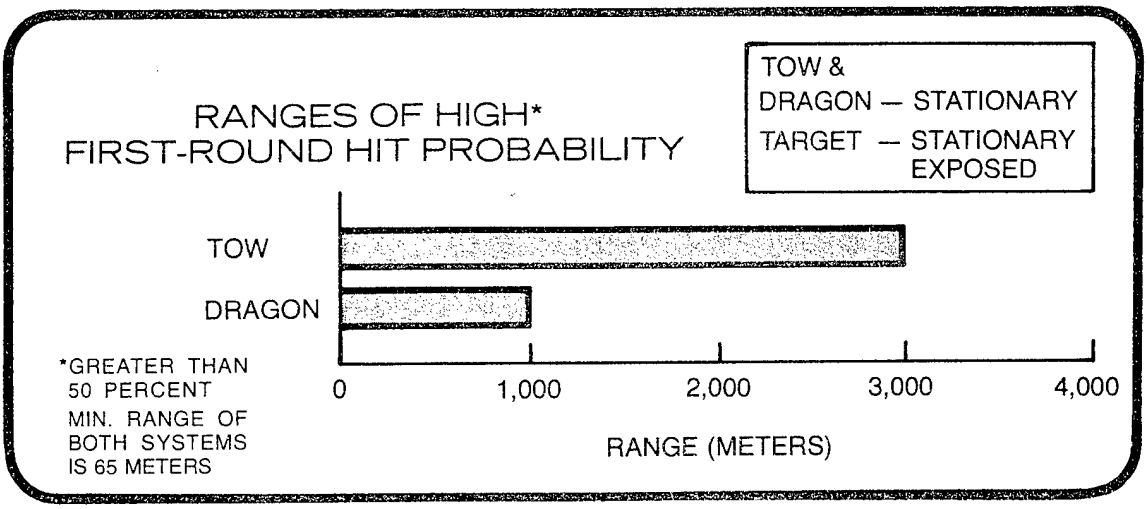
At these ranges the probability of a first-round hit against a moving target is less. Also, when engaging a target in a hull down position, the probability is lower because the target size is much smaller. **Remember though,** *the BMP must expose itself to engage as it cannot assume a good hull down firing position.*

Thus, we must teach our tankers to:

- **Engage with APDS for accuracy at long ranges**

TOW and Dragon

Given a hit, the TOW and Dragon will penetrate and kill the BMP. The chart below depicts the ranges at which the first-round probability of hit exceeds 50 percent.



While some differences in performance can be expected as a result of target aspect and speed, ATMG accuracy is insensitive to target speeds of up to 20 mph. Because of this probability of first-round hit, TOW and Dragon gunners should begin engagements at their maximum ranges. As the enemy closes, they should use flanking shots from positions offering good frontal protection.

Thus, we must teach our TOW and Dragon gunners to:

- **Engage the BMP at maximum range from good hull down positions in the defense and overwatch positions in the offense**
- **Use flanking shots from behind frontal cover as the enemy closes**

SHORT-RANGE WEAPONS

Caliber .50 Machinegun

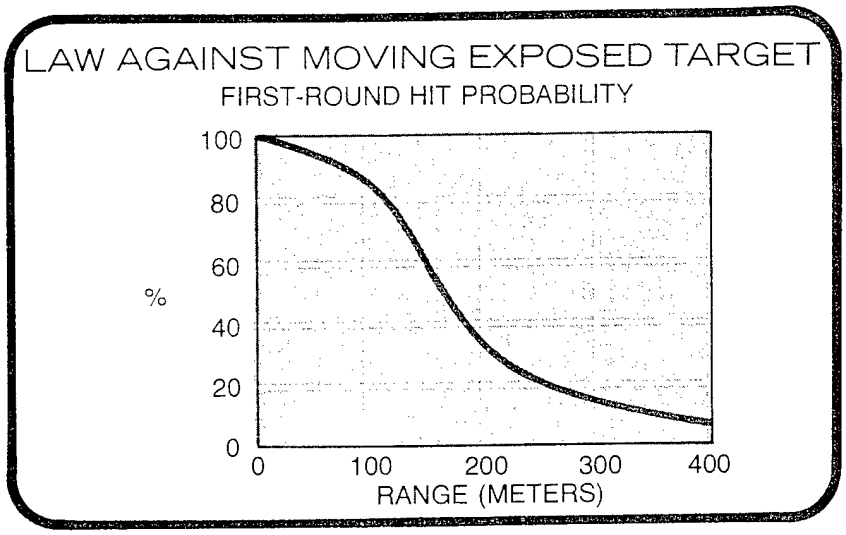
Tests have shown that the cal .50 MG, AP/API round will not achieve frontal penetration of the BMP; however, it will penetrate the BMP when fired directly into the side at ranges of 200 meters or less.

So, our cal .50 gunners must be taught:

- **Not to engage the BMP from the front**
- **Only engage from the side when no other antitank weapon is available and then at close ranges with AP/API rounds**

LAW

Firings against an exposed, moving target with the LAW indicate a 50 percent probability of a first-round hit at 150 meters.



Note that although the LAW has a 50 percent probability of a first round hitting a BMP at about 140 to 160 meters when engaging from the front or the flank, *the accuracy of the LAW is heavily influenced by errors in range estimation.* By actually knowing the range, or by firing in pairs or in sequence, these ranging errors can be reduced, and the probability of a hit increases markedly. (See TRADOC Bulletin 5 for more detailed data on LAW firing.)

Thus, LAW gunners must be taught to:

- **Engage the BMP at the longer ranges (150 to 300 meters) using pair or sequence firing**
- **Engage at short range (0 to 150 meters) using volley fire**

M203 Dual-Purpose Weapon (40mm)

The standard issue high explosive, dual-purpose (HEDP) round (not the HE round) will penetrate 2 inches of steel and therefore *will penetrate anywhere on the BMP given a hit.* A well trained gunner has a 50 percent probability of hitting a stationary BMP at 200 meters. Since the HEDP round requires 23 meters to arm, *effective engagements at 23 meters or closer are not possible.* The M203 also has a smoke round that can be employed close-in to obscure RPG-7 gunners.

We must, therefore, teach our M203 gunners to:

- **Begin engaging the BMP at 200 meters with HEDP**
- **Not use the M203 at less than 23 meters because the round will not detonate**

M202 Multishot Rocket Launcher

The M202 fires a 66mm incendiary rocket containing a filler that bursts into flame upon contact with air. A well-trained M202 gunner has a 50 percent probability of a first-round hit on an exposed stationary BMP at 200 meters. Given a hit, the warhead will **not** penetrate, but the flammable filler will stick to the BMP and burn. This may cause secondary fires and achieve a mobility kill. The BMP squad may also be forced to abandon the vehicle.

Thus, the M202 gunner must know that:

- **The M202 may suppress or cause the squad to abandon the BMP**

but

- **It should not be used when the LAW or M203 is available**

Remember

When engaging the BMP with all short-range weapons, *you are highly vulnerable to all weapons except the SAGGER ATGM.* So, use flanking shots from behind frontal cover.

SUPPORT WEAPONS

Mines

All standard hand-emplaced and scatterable antitank mines will kill or immobilize the BMP.

Thus:

- **Mines should be used in the defense, but must be covered with antitank fires**
- **Scatterable mines should be fired on a moving formation, thus placing them in the midst of a minefield. These fields should also be covered by antitank weapons**

Artillery and Mortars

Conventional HE artillery, either point detonating or variable time fuze, may distract the BMP gunner causing him to miss. Smoke can be employed to obscure the BMP gunner's vision, especially when SAGGER is being used at longer ranges. The standard 155mm dual-purpose, improved conventional munition (DPICM) *will penetrate and defeat the BMP,* given a hit. Therefore, DPICM fires should be used against motorized infantry formations.

By application of a high density of tank and ATGM fires the BMP squad can be forced to dismount. Once dismounted, their vulnerability will be increased by:

- **Slowing their rate of advance**
- **Thereby, increasing engagement time**
- **Thus making the BMP and dismounted squad more vulnerable to a greater number of our weapons, particularly artillery and mortars**

Close Air Support

Don't forget that the Air Force, too, will be called on to assist in defeating motorized forces, particularly in the enemy's second and third echelon, with such weapons as:

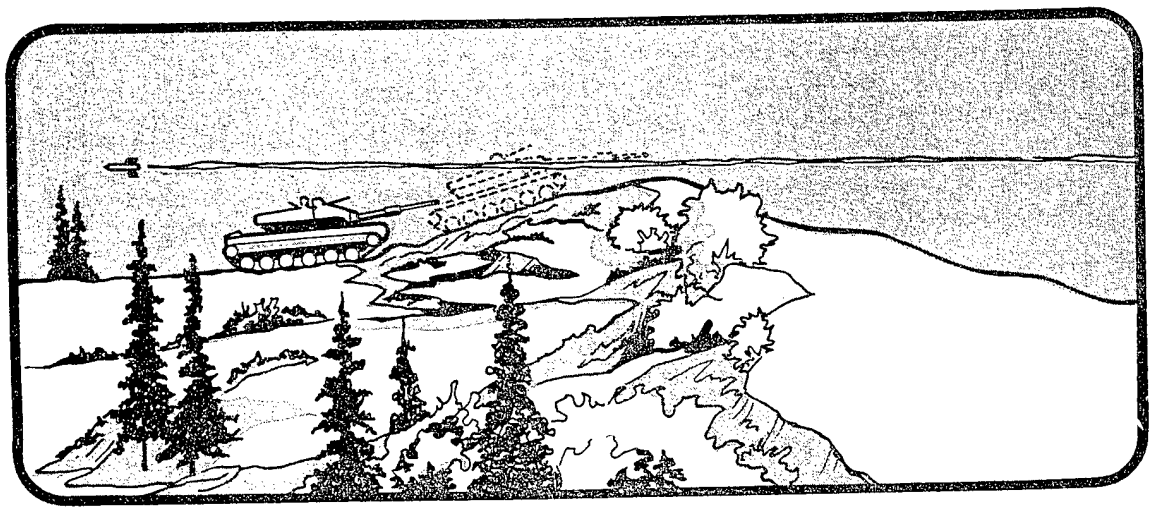
- **The GAU-8, 30mm gatling gun** which will penetrate and defeat the BMP, given a hit
- **Conventional bombs** which, given a close proximity or direct hit, will immobilize or destroy the BMP
- **Guided bombs,** such as Maverick, which have a high probability of first-round hit against the BMP and, given a hit, will destroy it.

PASSIVE TACTICS AND TECHNIQUES

COVER, CONCEALMENT, SMOKE, AND SUPPRESSION

Cover and Concealment

Tanks and mechanized forces in the attack, fighting from a defensive position or moving from battle position to battle position, must anticipate SAGGER and 73mm gun fires. Therefore *they must carefully select routes that provide cover and concealment.* These forces must also skillfully use the terrain by selecting good hull down firing positions. Careful use of terrain and continuous rapid movement make it difficult for enemy gunners to deliver accurate fires. Additionally, US tank and mechanized forces must remember that the SAGGER missile is visually guided by the BMP gunner. Thus, the most effective evasive technique against the SAGGER is to move immediately to natural cover. APCs and tanks can simply back down from a hull defilade to a complete hull down position as shown here:



Remember:

- **Skillful use of the terrain will effectively counter long-range SAGGER shots**

Smoke

Obscuration is an effective counter to the BMP. Smoke delivered in front of known or suspected BMP positions will degrade effective fire. High winds, particularly crosswinds, may make the use of smoke difficult, but such winds may also affect the accuracy of the 73mm gun.

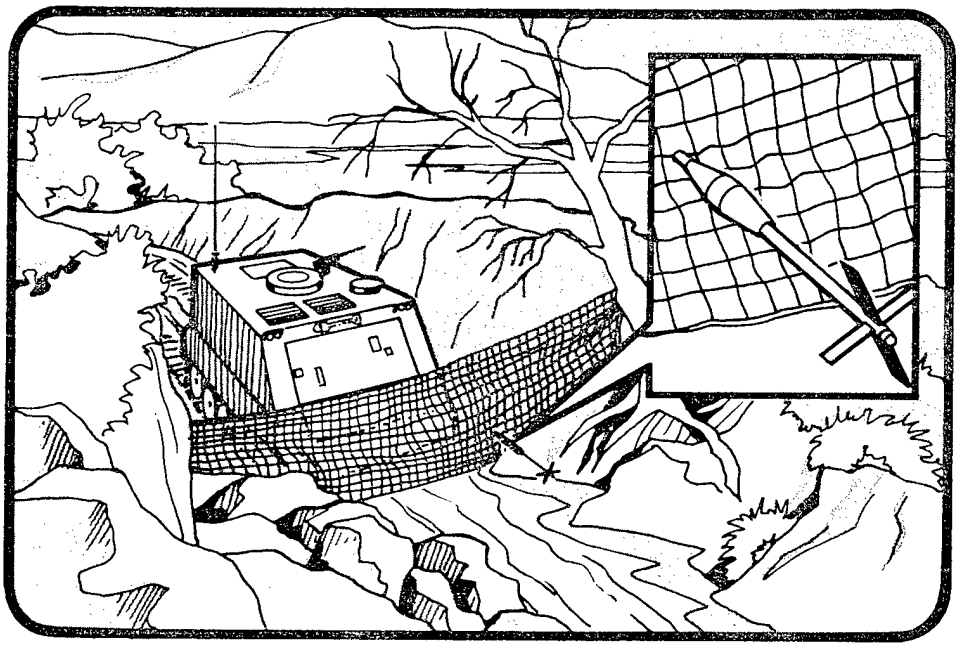
Suppression

When moving from battle position to battle position or in the attack, artillery, mortars, and direct-fire suppression from overwatch positions can be used to disrupt the SAGGER gunner.

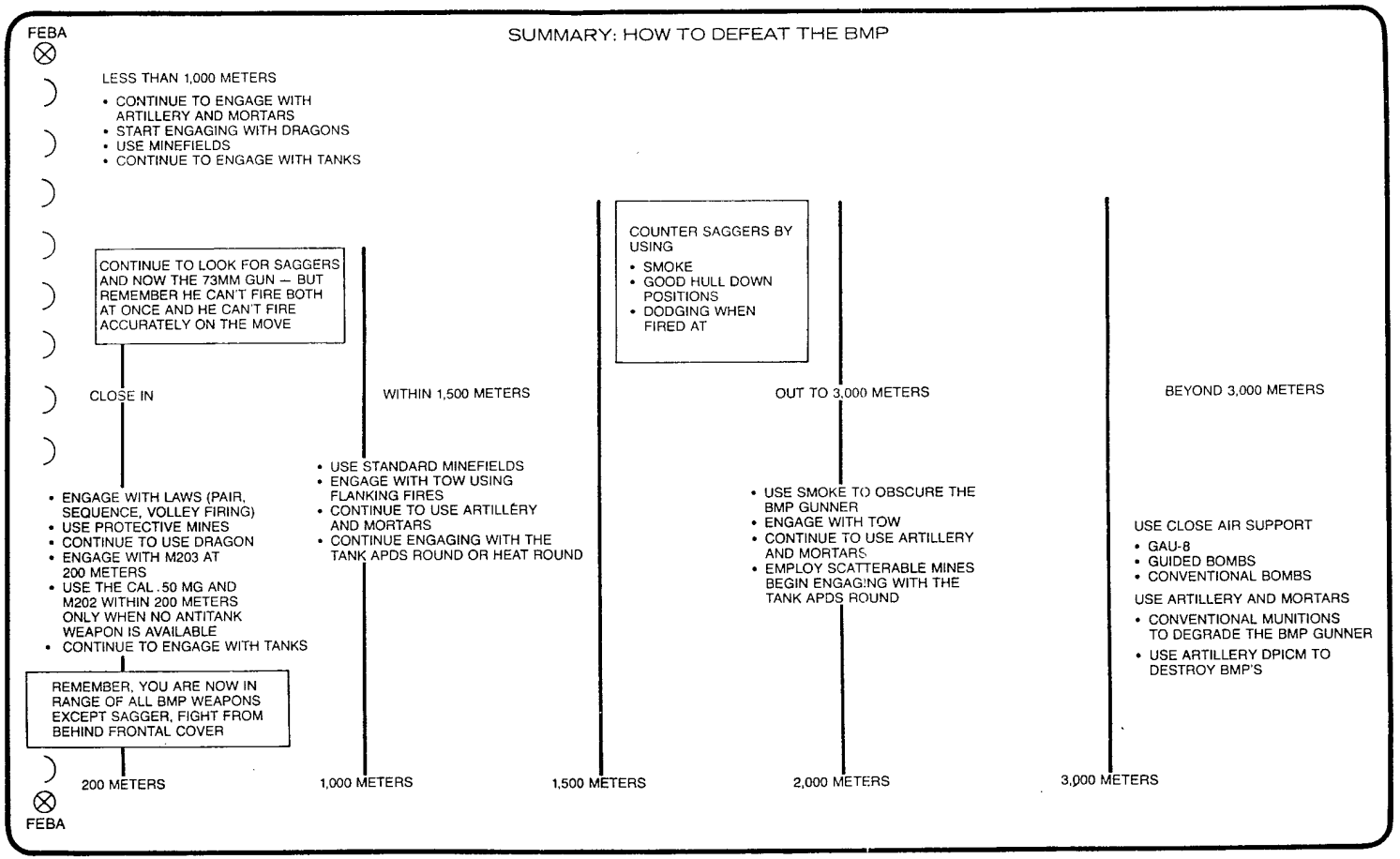
OTHER TECHNIQUES

COUNTERING THE RPG AND 73mm GUN

The RPG Screen was first used in Vietnam and was designed to provide portable standoff against RPG-7 hunter-killer teams for tanks and APCs in defensive positions. But, in fact, the screen will electrically dud both the RPG-7 and 73mm projectile and prevent any detonation in approximately 50 percent of the rounds fired into it.



For additional countermeasures against the SAGGER and RPG-7, see TRADOC Bulletins 2 and 3.


SUMMARY: HOW TO DEFEAT THE BMP
FEBA
LESS THAN 1,000 METERS
• CONTINUE TO ENGAGE WITH ARTILLERY AND MORTARS
• START ENGAGING WITH DRAGONS
• USE MINEFIELDS
• CONTINUE TO ENGAGE WITH TANKS
CONTINUE TO LOOK FOR SAGGERS AND NOW THE 73MM GUN — BUT REMEMBER HE CAN'T FIRE BOTH AT ONCE AND HE CAN'T FIRE ACCURATELY ON THE MOVE
COUNTER SAGGERS BY USING
• SMOKE
• GOOD HULL DOWN POSITIONS
• DODGING WHEN FIRED AT
CLOSE IN
WITHIN 1,500 METERS
OUT TO 3,000 METERS
BEYOND 3,000 METERS
• ENGAGE WITH LAWS (PAIR, SEQUENCE, VOLLEY FIRING)
• USE PROTECTIVE MINES
• CONTINUE TO USE DRAGON
• ENGAGE WITH M203 AT 200 METERS
• USE THE CAL .50 MG AND M202 WITHIN 200 METERS ONLY WHEN NO ANTITANK WEAPON IS AVAILABLE
• CONTINUE TO ENGAGE WITH TANKS
• USE STANDARD MINEFIELDS
• ENGAGE WITH TOW USING FLANKING FIRES
• CONTINUE TO USE ARTILLERY AND MORTARS
• CONTINUE ENGAGING WITH THE TANK APDS ROUND OR HEAT ROUND
• USE SMOKE TO OBSCURE THE BMP GUNNER
• ENGAGE WITH TOW
• CONTINUE TO USE ARTILLERY AND MORTARS
• EMPLOY SCATTERABLE MINES BEGIN ENGAGING WITH THE TANK APDS ROUND
USE CLOSE AIR SUPPORT
• GAU-8
• GUIDED BOMBS
• CONVENTIONAL BOMBS
USE ARTILLERY AND MORTARS
• CONVENTIONAL MUNITIONS TO DEGRADE THE BMP GUNNER
• USE ARTILLERY DPICM TO DESTROY BMP'S
REMEMBER, YOU ARE NOW IN RANGE OF ALL BMP WEAPONS EXCEPT SAGGER, FIGHT FROM BEHIND FRONTAL COVER
200 METERS
1,000 METERS
1,500 METERS
2,000 METERS
3,000 METERS
FEBA

APPENDIX A
BMP VARIATIONS

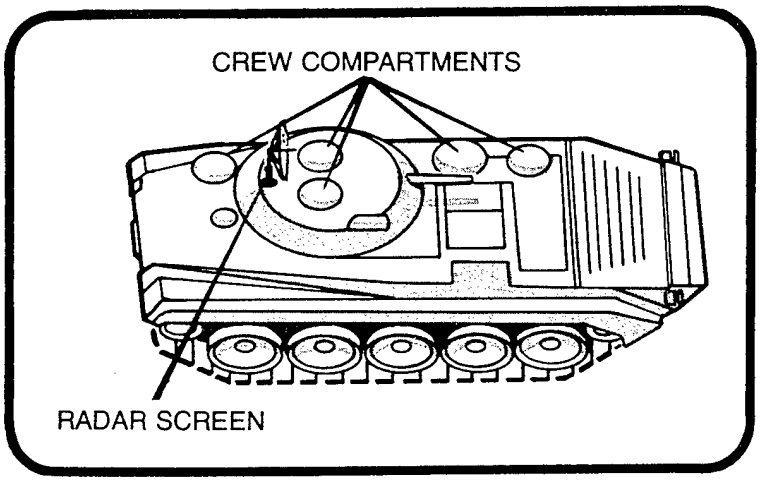
While the BMP is relatively new, these variations have already been fielded, and it is expected that further modifications providing for additional combat roles will also be seen in the future.

BMP "RADAR"

This vehicle will probably be utilized as an artillery acquisition vehicle.

The BMP "RADAR" has:

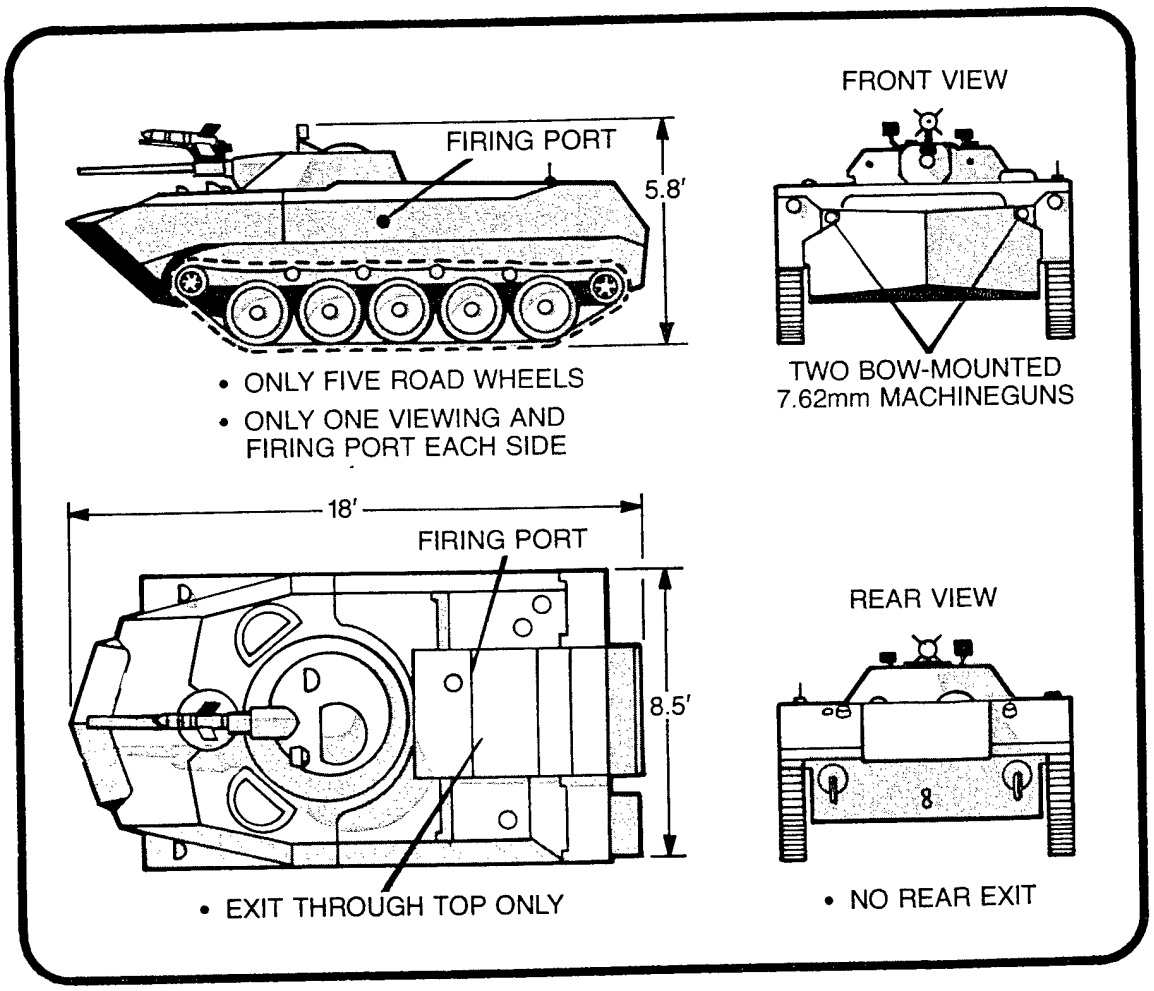
- **A five-man crew, but no troops**
- **What is thought to be a foldable fire adjustment and/or artillery/mortar-locating antenna on the rear.**
- **Extensive radio and optical equipment.**
- **Armament which consists only of a single machinegun mounted in the turret — confirming a noncombatant role.**



BMD

The airborne amphibious combat vehicle, BMD, is similar to the BMP in basic construction, yet differs slightly in armament, occupant capacity, and upper body design. It is approximately 5 to 6 tons lighter in weight which allows for its air dropability and role in airborne operations.

When compared with the BMP, the BMD has:



Additionally

THE BMD

- **Is 10 km/h faster (land speed) than the BMP**
- **Carries two or three less personnel**
- **Has three gunners — one for the SAGGER/73mm main gun, and two bow machinegunners, one for each of the bow machineguns.**

APPENDIX B

MANUALS AND OTHER PUBLICATIONS

THREAT DOCTRINE

DDI 1100-77-76, The Soviet Motorized Rifle Company (Defense Intelligence Agency)
FM 30-40, Handbook on Soviet Ground Forces
TC 30-102, The Motorized Rifle Company
TC 30-3, Soviet Equipment Recognition Guide
TC 30-4, The Motorized Rifle Regiment

US DOCTRINE

TC 7-1, The Rifle Squad (Mechanized and Light Infantry)
FM 7-7, The Mechanized Infantry Platoon/Squad
FM 71-1, The Tank and Mechanized Infantry Company Team
FM 71-2, The Tank and Mechanized Infantry Battalion Task Force

RELATED TRADOC BULLETINS

TB 1c, Range and Lethality of US and Soviet Antiarmor Weapons
TB 1u, Range and Lethality of US and Soviet Antiarmor Weapons
TB 2c, Soviet ATGMs
TB 2u, Soviet ATGMs
TB 3c, Soviet RPG-7, Antitank Grenade Launcher
TB 3u, Soviet RPG-7, Antitank Grenade Launcher
TB 4c, Soviet ZSU 23-4: Capabilities and Countermeasures
TB 5u, Training With LAW
TB 6u, Countersurveillance and Camouflage
TB 9u, Infantry Fighting Positions

TRAINING FILMS

Modern Battle **(TF 21-4925)**
The BMP — Capabilities and Countermeasures **(TF 21-4993)**
Infantry Fighting Positions, Part I **(TVT-2E-071-INF 1-B)**
Threat Tactics — The Breakthrough **(TVT-2E-777-0445-B)**

APPENDIX C

ORDERING TRADOC BULLETINS

PURPOSE

A series of TRADOC bulletins is being published by HQ TRADOC to provide commanders timely technical information on weapons, tactics, and training techniques. The bulletins are not intended to supplant doctrinal publications, but to supplement material on "How to fight" with data derived from tests, recent intelligence, or other sources which probe "why?"

APPLICABILITY

TRADOC Bulletins are developed by Headquarters, TRADOC, using the most comprehensive and current military and civilian data available. Army Training and Evaluation Programs (ARTEP), Field Manuals (FM), and Training Circulars (TC) will continue to be the primary training references. TRADOC Bulletins will supplement them with an explanation of why we are training in a given manner. TRADOC Bulletins should enable commanders to better stimulate and motivate subordinates to understand why we train the way we do.

INDEX OF SERIES

TRADOC Bulletins are cataloged in DA Pamphlet 310-3. "Index of Doctrinal, Training and Organizational Publications." The series is numbered consecutively, and each TRADOC Bulletin is announced at the time of printing in the information bulletin distributed to all pinpoint account holders by the US Army AG Publications Center.

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DA Pamphlet 310-10 explains the pinpoint distribution system and how to establish or update an existing account at the US Army AG Publications Center.

DA Form 12-11B EXCERPT

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FEEDBACK – YOUR TURN

TRADOC Bulletins are designed to present timely information on weapons, tactics, and training to units in the field. Bulletins focus on the "why" or rationale for our doctrine. Your response to the questionnaire will help us stay on target.

1. Rank_____ Branch_____ Type Unit_____
   Component_____ (Act, NG, Res)
2. **Are you located at:**
   _____ Company level
   _____ Battalion level
   _____ Brigade level
   _____ Other (specify)
3. **Where did you see this bulletin?**
   _____ Company day room
   _____ Orderly room
   _____ Library
   _____ Other (specify)
4. **Did this bulletin (check any or all):**
   _____ Give you info you didn't know before
   _____ Help in training
   _____ Provide you with info you had been presented before
   _____ Convince you that you should do something differently
5. **What leaders/soldiers in your units do you think will make best use of this bulletin?**
   _____ E3/4
   _____ E5/E6
   _____ PLT SGT
   _____ PLT LDR
   _____ 1ST SGT
   _____ CO CMDR
   _____ BN STAFF
   _____ BN CMDR
   _____ OTHER
6. **How will this bulletin be used in your unit?**

7. **Which TRADOC Bulletins have you read?**
   _____ #1 (C) Range and Lethality of US and Soviet Anti-Armor Weapons (U)
   _____ #1 (U) Range and Lethality of US and Soviet Anti-Armor Weapons (U)
   _____ #2 (C) Soviet ATGMs: Capabilities and Countermeasures (U)
   _____ #2 (U) Soviet ATGMs: Capabilities and Countermeasures (U)
   _____ #3 (C) Soviet RPG-7 Antitank Grenade Launcher (U)
   _____ #3 (U) Soviet RPG-7 Antitank Grenade Launcher (U)
   _____ #4 (C) Soviet ZSU-23-4: Capabilities and Countermeasures (U)
   _____ #5 (U) Training with LAW (U)
   _____ #6 (U) Countersurveillance and Camouflage (U)
   _____ #8 (U) Modern Weapons on the Modern Battlefield (U) (Superseded by Chapter 2 of FM 100-5,**Operations,**1 Jul 76)
   _____ #9 (U) Infantry Fighting Positions
8. **What other subjects for Bulletins would help you?**

9. **Other comments:**

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30 JUNE 1977

W. E. DePUY
General, United States Army
Commanding

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